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The Journal of the International College of Surgeons

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attending the 1940 Annual Meeting in Venice, Florida (Feb. 11-14)

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THE Journal of the International College of Surgeons is published for the time being under the auspices of the United States Chapter of the International College of Surgeons, for the advancement of surgery and as a medium of publication for reports of research, clinical observations and experimental work in surgery, as well as to acquaint members of the International College of Surgeons throughout the world of its activities.

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Material: Scientific articles and communications on matters of surgical and related interests are invited. These must be submitted to the Editorial Board, which reserves the right to reject any material deemed unsatisfactory. All manuscripts are subject to editorial modification.

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Article I, Section V, of the Constitution of the College reads:

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One carbon copy should accompany the original paper. A summary must be given at the end of the article.

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Members, Fellows and officers of the International College of Surgeons and chapters do not pay additional subscription fees for the Journal. These are included in the annual dues.

News Items: The Journal will be pleased to publish personal news and all items of interest. Items dealing with appointments to hospitals and medical schools, activities of meetings, etc., if considered by the editors to be of sufficient interest, will be included in the columns of the Journal. Such items may be sent to the Editorial Office, 850 West Irving Park Boulevard, Chicago, Illinois.

Editorials

THE TREATMENT OF PEPTIC ULCER

The general attitude concerning the treatment of peptic ulcer has gradually changed in recent years. The pendulum has continued to swing toward the conservative side. The usual belief at this time seems to be that most duodenal ulcers, particularly in young people, can be handled very well by medical means. Probably the ideal professional setup in the hospital treatment is for the medical and surgical staffs to cooperate in the supervision of the patients with ulcer. At one time, the Sippy diet plus alkalies was thought to be law and gospel. Many at this time favor a much more liberal diet, and still others question the value of alkalies. That protein, particularly meat, constitutes a definite buffer against the effects of gastric acid on the stomach wall, there seems to be no doubt.

There has developed a well marked tendency to restrict gastro-enterostomy to those cases in which cicatricial constriction of the pyloric ring has taken place. In other types of cases, there is some question as to the absolute benefit to be derived from this operation.

Undoubtedly, environment that protects the patient from stress and strain, likewise drugs that lower the output of gastric secretion, are of value.

In regard to the treatment of bleeding ulcers, the liberal diet advocated by Meulengracht has been proved to be of definite value and is gradually gaining adherents. The use of the new vegetable extract containing oxalic acid, worked out by Steinberg and others in the Kensington Research Laboratories, will doubtlessly prove to be of value in the treatment of bleeding ulcers during the emergency period. The bleeding ulcer that develops before middle age is more responsive to diet and medication, whereas the ulcer that begins to bleed during the arteriosclerotic period of life constitutes a grave emergency that calls for early surgical intervention. The duodenal ulcer that defies medical treatment or causes intolerable pain calls for surgical intervention of the radical sort. Likewise, some cases in which for economic reasons it may be impossible to carry out a proper dietetic and medical regimen. The best operative results are those which have followed resection of about three fifths of the stomach.

The treatment of ulcer of the stomach will undoubtedly continue to be largely surgical. Some of the gastric ulcers, particularly if situated on the greater curvature, can be satisfactorily treated by excision, whereas, those on the lesser curvature will, for the most part, call for radical resection.

The general subject of treatment of peptic ulcer still leaves much to be desired, all methods being handicapped by many limitations and no one being entirely satisfactory.

JOHN E. CANNADAY, M.D.,
Charleston, W. Va.

PRIZE ESSAY ON ANESTHESIA

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BUSINESS SECRETARY OF U. S. CHAPTER APPOINTED

At a meeting of the Executive Council of the United States Chapter of the International College of Surgeons held September 30 in Davenport, Chapter was created and Mr. Ralph E. Osborne of Toledo, Ohio, was appointed to fill that position.

Mr. Osborne, who was chosen upon the recommendation of Dr. Frederick M. Douglass, President, served the Chapter in a special auditing and research assignment in August and September, 1939, when the Chapter had to effect numerous changes in the methods of administering its business affairs following the retirement of Dr. Edward Frankel, Jr., as Executive Secretary. For many months previous to that it had been apparent to the Council that the affairs of the Chapter had grown to such an extent that they could no longer be handled efficiently by the academic officers.

Mr. Osborne is serving the Chapter on a full-time salaried basis. As a business executive with wide experience in office practice, accounting, and budget control, he has been able to create and maintain the detailed book and file records that a growing institution requires to keep abreast of its membership affairs and academic operations. Under the terms of his contract, he is at the disposal of the entire membership for information. He may be addressed at 1020 Prospect Avenue, Toledo, Ohio.

In addition to his duties as Business Secretary to the Chapter, Mr. Osborne will act as Corresponding Secretary to the Board of Examiners.

THE USE OF MAGNESIUM TRISILICATE, COLLOIDAL KAOLIN AND ALUMINUM HYDROXIDE IN ANTACID GASTRIC THERAPY

HISTORICAL NOTES ON ULCER OF THE STOMACH AND DUODENUM

HYMAN I. GOLDSTEIN, M.D.,
President of the Northern Medical Association of Philadelphia
CAMDEN, N. J.

FOR many centuries the problem of the treatment of ulcer of the stomach and duodenum has been of much concern to those interested. Inflammatory and ulcerative diseases of the stomach were discussed and treated by Paulus Aeginata (625-690 A.D.); Bartolomeo da Montagnana [(1395-1460) Consilia . . . , Venice, 1514]; Montanus (1498-1552); Laurentius Scholzius (Scholtz von Rosenau, 1552-1599): Joannes Heurnius (Jan van Heurne, 1543-1601); Christopher Guarinonius ("Consilia Medicinalia," Consultatio 459, pp. 520-521, 1610, Venice); Johannes Crato à Kraftheim (1516-1586); Thomas Bartholinus ("Historiarum Anatomicarum Rariorum," Cent. III, Historia XCII and L, 1657); Laurentius Phryesen (Fries, died circa 1532: "Spiegel der Artzney desgleichen," pp. CXXXIII-CXLIV, 1518, Strassburg); Joh. Varandaeus (died 1617; "Tractatus de Morbis ventriculi," 1620, Lugduni); Antonius Fumanellus (In "Opera multa et varia," "De Ventriculi affectibus praeter naturam," pp. 513-518, 1557, Zurich, ed. 1); Balduinus Ronsseus (died 1596; "Opuscula Medica," a poem on "Ventriculi Morbis," "Singultui," and "Coeliacis," in "Venatio Medica," Section III, pp. 75 and 77, Lugduni Batavorum, 1618); Oribasius Sardianus ("Medica Opera," "Synopseos ad Eustathium," Liber IX, Caput X, p. 138, and Caput XI, 1553, Venice); Rosenstein (Dissert. de inflammatione ventriculi, Upsal. 1741); P. Hecquet [(1661-1734) "de la digestion et des maladies de l'estomac," etc.]; Arthur Daniel Stone (London, 1806); G. Dieulafoy (1897, 1898, 1912), and others.

SYNOPSIS OF LITERATURE

Many of the early reports of importance have been entirely overlooked by investigators, gastroenterologists and surgeons in recent years, particularly the many interesting inaugural dissertations and the reports published in the Journal de Médecine, Chirurgie, Pharmacie, etc., Paris. In Tome III, pp. 407-434, Pluviôse an X, 1802, Citizens Corvisart and J. J. Leroux published in this journal an article entitled, "Obser-

Non minus hoc nato gauder Verona parente
Eximium patriæ præbet uterq; decus.

Joan. Bapt. Montanus (1498-1552).

vation sur une ouverture fistuleuse a L'Estomac." This was an epoch making report of a rather careful study with experiments on digestion in the case of a single woman, Magdalene Goré, 47 years of age, who for many years had a *gastric fistula*. This report and the reports by A. Wencker (1735) and Jakob

Nonnulli enim in capite totius morbi præcipuam eſſe cauſam cenſebant: ideoque, ut calvaria in vertice terebello perforaretur, ſuadebãt. Alii verò cauſam morbi in parte aliqua ventriculi eſſe affirmabant. Quos certè minimè fœlix opinio. Quandoquidem ego poſt mortem advocatus, præſente clariſſimo viro DN. ROSCIO, multiſque aliis, cadaver incidi, primùmque cerebrum inſpexi, in cujus ventriculis ad libras duas aquæ limpidæ inveni, arteriæ item & venæ membranarum cerebri, ſanguine craſſo & fœculento turgebant. In intimo ventre omnia ſecundùm naturam ſeſe habebant, præter ventriculum, in cujus orificio ſuperiori, & quidem ex parte anteriori, ubi ramus ſextæ conjugationis nervorum ventriculo inſeritur, ulcus erat magnum ac fœtidum, quod in vacuum uſque ventriculi penetrabat. Putaſne, vir clariſſime, ulcus hocce doloris iſtius vehementiſſimi capitis, aliarumque partium cauſam extitiſſe? Tanta enim, ut ſcis, inter ſtomachum ac cerebrum, hujus nervi beneficio, eſt ſympathia atque conſenſus, ut uno malè affecto, alterum quoq; ſimul laboret. Ventriculas præterea humoribus corruptis, fœtidis & atrabilariis refertus erat. Externæ partes propter violentiam ac diuturnitatem morbi planè extenuatæ erant. His vale vir clariſſime, cum tuis omnibus, quos tecum ego & uxor mea peramanter ſalutamus. Patetmiaci Aventicorum 30. Novembris 1609.

Left, William Fabricius Hildanus (1560-1634). Right, His *Opera Observationum et Curationum*, Francofurti, 1646.

Helm (Vienna, 1803) have been entirely overlooked. William Beaumont (1785-1853) studied the case of Alexis San Martin (Medical Recorder, Philadelphia 8:14, 1825, and 9:94-97, 1826) nearly a quarter of a century later and, no doubt, inadvertently missed the report by Corvisart and Leroux (1802). Our noted medical historian, the late Col. Fielding H. Garrison (History of Medicine, 1929, 476) erroneously states, "Beaumont was the first to study digestion and the movements of the stomach *in situ* (1825)."

The dissertations of interest are those by L. Brugnatelli ("Saggio d'un analisi chimica de'sughi gastrici," Pavia, 1784); De Galatheau ("La digestion de l'estomach touchant l'humeur *acide*," Paris, 1675); J. Lossius and J. C. Vettelbach ("De fermento ventriculi," Jenae, 1665); J. Black ("De humore *acido* a cibis orto, et magnesia alba," Edinburgi, 1754); Bernardus Swalve ("Alcali et Acidium Sive Naturae et Artis instrumenta pugilica," Amstelodami, apud Johannem Janssonium à Waesberge, 1670); J. A. Schlemmer ("De ventriculo, exponens ejus anatomiam, physiologiam, et aetiologiam pathologicam," Pragae, 1754); P. Jas ("De mirabili, quae pectus inter et ventriculum intercedit, sympathia," Lugdundi Batavorum, 1784); J. Senebier ("Observations importantes sur l'usage du suc gastrique dans la chirurgie. Avec quelques additions de l'abbé Spallanzani à ses expériences sur la digestion," Genève, 1785); D. Veegens ("De sympathia inter ven-

triculum et caput, praecique in statu praeternaturali," Lugdundi Batavorum, 1784); C. Wightman ("De consensu ventriculum inter et cerebrum," Edinburgi, 1808); and G. Box ("De ventriculi usu et actione in ingesta," Lugdundi Batavorum, 1744).

Alvarez has recently called attention to "An Experimental Study of the Action of Oil on Gastric Acidity and Motility," by D. M. Cowie and J. F. Munson [Arch. Int. Med. I: No. 1, pp. 61-101 (Jan.) 1908], which should be reread by many of us, as well as "Traité

Wm. Fabricius Hildanus, *Observationum et Curationum Chirurgicarum*, 1646 Centuria III; Observatio XX.

sur les gastralgies et les entéralgies ou maladies nerveuses de l'estomac et des intestins," by J. P. T. Barras (ed. 2, Paris, 1827), and the comprehensive monograph (with very complete bibliography) by Viktor Lieblein and Heinrich Hilgenreiner, "Die Geschwüre und Die Erworbenen Fisteln Des Magen-Darmkanals" (Deutsche Chirurgie, Lieferung 46 C., von Ferdinand Enke, 1905).

The development of *ulcer after burns and after various abdominal operations* should be of some concern to the surgeon. Cumin [Edinburgh M. & S. J. 19: Sect. II, 337-344 (July) 1823] found inflammation of the intestines and peritoneum in cases of severe burn. Joseph Swan [Edinburgh M. & S. J. 19: Part III, 344-345 (July) 1823] reported the case of Joseph Baily, 5 years of age. At necropsy, every part appeared sound except the stomach, in the villous coat of which were several spots and stripes like sloughs, extending deep, and quite black. The lungs were sound. "The membranes of the brain were much more vascular than natural . . . There can be no doubt that the diseased appearances of the head and stomach were produced by the irritation of the skin" ("Practical Observations: Case of A Severe Burn"). This report by Swan antedates Curling's report (1842) by nineteen years. Recently, Harkins published a paper on this subject (Surgery 3: 608-641, 1938), and Penner and Bernheim (1939) also discussed this subject and reviewed the literature [Arch. Path. 28: No. 2, 129-140 (Aug.) 1939].

J. E. Summers, Jr., considered "The Cause and Possible Prevention of Gastric and Intestinal Hemorrhages following Operations for Appendicitis, Hernia, etc. [Medical Herald, St. Joseph, Missouri, 25: 469-475 (Nov.) 1906]. J. B. Roberts discussed "Gastric and Duodenal Ulcers Secondary to Wounds of the Urinary Bladder" [Trans. Amer. Surg. Assoc., Philadelphia, 26: 202-225, 1908; Ann. Surg. 47: 924-925, 1908] and mentioned the earlier reports by Billroth (1867) and Eiselsberg. Robert Jardine [Glasgow M. J. 62: 126-129, 1904; Trans. Glasgow Obst. Gynaec. Soc. (1902-1904), 4: 227-230, 1905; reported March 23, 1904] and Louis Sauvé [Revue de Chirurgie 31: pp. 211-225 (Feb.), pp. 363-382 (Mar.), pp. 492-508 (Apr.) 1905, Paris, Felix Alcan] made similar reports. J. K. Kelly (1904) mentioned two cases of ulceration of the stomach complicating ovarian cystomata. Elizabeth Pace (1904) had a patient who died on the twelfth day with gastric hemorrhages after appendectomy. At postmortem examination, an old gastric ulcer was found.

Among the articles that have appeared recently (1938-1939) concerning *the treatment of ulcer of the stomach and duodenum,* and which are of particular interest to those working in this field of medicine, may be mentioned the publications by Mutch and Mann (London), E. B. Lewis, Falconer and Lyall, Collip, R. E. Kelly, Anthony Bassler (New York), Brown and Dolkart, Tidmarsh, S. C. Robinson, Daly, Morlock, St. John and Flood, C. M. Jones, Woldman and Polan, Kyger, Jr. et al, Graham (Toronto), Kellogg (Seattle), La Due, M. B. Levin et al, C. W. Eisele, Aaron (Buffalo), and Franklin Hollander (Amer. J. Digest. Dis. 6: No. 2, p. 127, April, 1939), and W. P. Havens [J.A.M.A. 113: 1564 (Oct. 21) 1939].

I. NONSYSTEMIC ANTACID THERAPY

For the past several years the writer has been interested in the use of *nonsystemic antacid therapy* in the treatment of gastric and duodenal ulcer. The combined use of magnesium trisilicate, colloidal kaolin, and aluminum hydroxide in sufficient amounts nearly to neutralize all "free acid," over a considerable period of time, has favorably controlled these cases.

Trisilicate of magnesium appears to be nonirritating to the stomach and is

neither laxative nor constipating. It does not alter the acid-base balance of the blood serum. Hydrated trisilicate of magnesium is chemically identical with *Meerschaum* or *écume de mer* or *Glocker's sepiolite* with the formula $H_4Mg_2Si_3O_{10}$ or $Mg_2Si_3O_8 \cdot 2H_2O$. It has been used as a substitute for soap and Fuller's earth. "Magnesite" and "aphrodite" (Sweden) are similar to the trisilicate of magnesium. The silica (S_1O_2) formed acts as a further adsorbent of acid as it is an active hydrated colloid. In the presence of acid, magnesium trisilicate becomes a colloidal gel which hinders absorption. *Calcium carbonate,* which is popular in ulcer therapy, is constipating when large quantities are required for neutralization and releases carbon dioxide (CO_2). *Sodium bicarbonate,* as is now well recognized, is definitely irritating in high concentration and causes the secondary rise of acid. It is systemic in effect and *not infrequently causes subclinical alkalosis.* It releases carbon dioxide, thus producing increased intragastric tension. Because of these facts, the essayist was led to try the combination of trisilicate of magnesium (50 per cent), colloidal kaolin (25 per cent), and aluminum hydroxide (25 per cent) in antacid therapy for the treatment of ulcer of the stomach and duodenum.

FORMS OF THERAPY

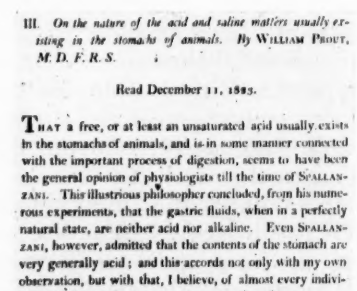
Since the experimental studies by the Abbé Lazzaro Spallanzani (1729-1799), of Pavia, Sir Benjamin Collins Brodie (1783-1862), R. D. Thomson (1840), Schiff (1845, 1846, 1854, 1867), William Beaumont (1785-1853), Réaumur (who, in 1752, isolated the gastric juice and demonstrated its solvent effect upon foods), Ebstein, Lebert, Jaworski, Adolf Kussmaul (1822-1892), Ivan P. Pavloff (1849-1936), and many others too numerous to mention, all forms of *therapy* have been recommended for the treatment of gastric and duodenal ulcers. Bassler (New York, Rev. Gastroenterol., July-Aug., 1939), in his most recent article on the treatment of peptic ulcer, states (Read Dec. 29, 1938) that Baillie gave an accurate description of gastric ulcer, accompanied by case histories, in 1793, and that Riegel, in 1886, introduced the use of *alkalies,* mainly for hyperchlorhydria. May I, in this review, make note of the early report by J. G. Sommer (1696) on "De Ardore Ventriculi" and the use of soda for hyperacidity; the discussion by A. Q. Rivinus (1652-1723), "De *acido* ventriculi fermento" (1677); the use of "alkaline and absorbent medicines" and a "dieta antacida" by A. G. Richter (1742-1812) in 1794; the employment of *sodium bicarbonate* in "painful stomach" by Trousseau and Bonnet (1832); and the use of bicarbonate soda by Reichmann in his studies on patients (Warsaw, 1895). Adolf von Strümpell, during 1895-1911, used *bismuth* and *bicarbonate of soda* in the treatment of peptic ulcer, long before Sippy popularized his antacid and astringent therapy.

Spallanzani (1782) believed that digestion begins and ends in the stomach. Giovanni A. Borelli (1608-1679) treated digestion as a purely mechanical process —a grinding and crushing action of the stomach. Jean Baptiste van Helmont (1577-1644), a Belgian mystic, had considerable knowledge of the gastric juice and the acids of the stomach. Charles Richet (1850-), produced (1878) a copious flow of gastric juice in a patient who had to be fed through a gastric fistula on account of a strictured esophagus, and made other interesting investigations on the gastric juice.

Since these early days, we have had presented to us many forms of *dietary regimes* for *gastric ulcer,* such as those of Jacob Bissegger (1856, Zurich), William Leube (1897), Lenhartz (1904), Lambert (1908), Sippy (1915), and E. Meulengracht (Copenhagen).

Thus it is seen that alkalis have been used for centuries, but it was not until

1824 that Prout and Scopoli (followed by Bidder and Schmidt, in 1852) demonstrated *hydrochloric acid in the* digestion. Claude Bernard (1813-1878) performed some of the earliest experiments with *alkalis*. Bernard noted that



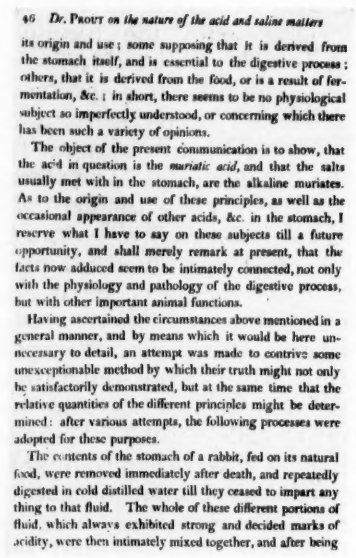
III. *On the nature of the acid and saline matters usually existing in the stomachs of animals.* By WILLIAM PROUT, *M. D. F. R. S.*

Read December 11, 1823.

THAT a free, or at least an unsaturated acid usually exists in the stomachs of animals, and is in some manner connected with the important process of digestion, seems to have been the general opinion of physiologists till the time of SPALLANZANI. This illustrious philosopher concluded, from his numerous experiments, that the gastric fluids, when in a perfectly natural state, are neither acid nor alkaline. Even SPALLANZANI, however, admitted that the contents of the stomach are very generally acid; and this accords not only with my own observation, but with that, I believe, of almost every individual who has made any experiments on the subject.

With respect to the nature of this acid, very various opinions have been entertained. Some of the older chemists seem to have considered it as an acid, *sui generis*; by others it was supposed to be the phosphoric, the acetic, the lactic acid,* &c. No less various have been the opinions respecting

* After I had discovered the principal fact related in this paper, I was surprized to find how nearly SCOPOLI had come to the same conclusion. He did not indeed come to the conclusion, as far as I can ascertain, that free muriatic acid exists in the stomach, but he advanced the opinion, that the muriatic acid, in union with ammonia, found in such abundance in the stomach of ruminating animals, is generated by that organ itself. The only account of SCOPOLI's experiments I have seen is in JOURDAN's Animal Chemistry, i. 183.



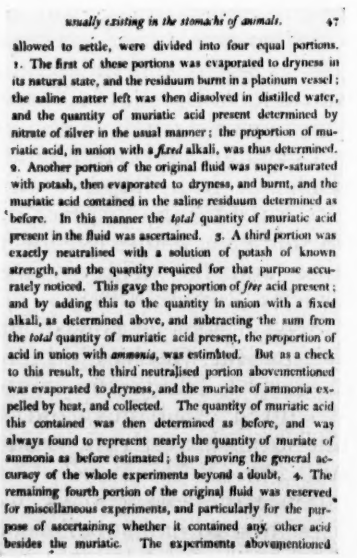
46 *Dr.* PROUT *on the nature of the acid and saline matters*

its origin and use; some supposing that it is derived from the stomach itself, and is essential to the digestive process; others, that it is derived from the food, or is a result of fermentation, &c.; in short, there seems to be no physiological subject so imperfectly understood, or concerning which there has been such a variety of opinions.

The object of the present communication is to show, that the acid in question is the *muriatic acid*, and that the salts usually met with in the stomach, are the alkaline muriates. As to the origin and use of these principles, as well as the occasional appearance of other acids, &c. in the stomach, I reserve what I have to say on these subjects till a future opportunity, and shall merely remark at present, that the facts now adduced seem to be intimately connected, not only with the physiology and pathology of the digestive process, but with other important animal functions.

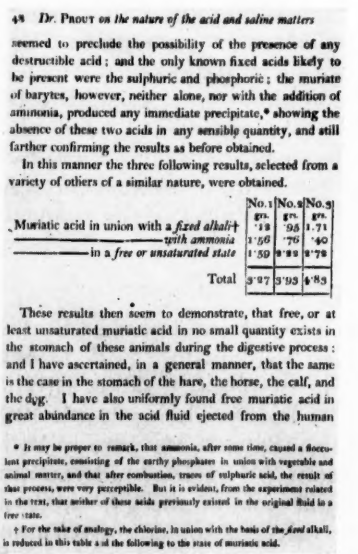
Having ascertained the circumstances above mentioned in a general manner, and by means which it would be here unnecessary to detail, an attempt was made to contrive some unexceptionable method by which their truth might not only be satisfactorily demonstrated, but at the same time that the relative quantities of the different principles might be determined: after various attempts, the following processes were adopted for these purposes.

The contents of the stomach of a rabbit, fed on its natural food, were removed immediately after death, and repeatedly digested in cold distilled water till they ceased to impart any thing to that fluid. The whole of these different portions of fluid, which always exhibited strong and decided marks of acidity, were then intimately mixed together, and after being



usually existing in the stomachs of animals. 47

allowed to settle, were divided into four equal portions. 1. The first of these portions was evaporated to dryness in its natural state, and the residuum burnt in a platinum vessel; the saline matter left was then dissolved in distilled water, and the quantity of muriatic acid present determined by nitrate of silver in the usual manner; the proportion of muriatic acid, in union with a *fixed* alkali, was thus determined. 2. Another portion of the original fluid was super-saturated with potash, then evaporated to dryness, and burnt, and the muriatic acid contained in the saline residuum determined as before. In this manner the *total* quantity of muriatic acid present in the fluid was ascertained. 3. A third portion was exactly neutralised with a solution of potash of known strength, and the quantity required for that purpose accurately noticed. This gave the proportion of *free* acid present; and by adding this to the quantity in union with a fixed alkali, as determined above, and subtracting the sum from the *total* quantity of muriatic acid present, the proportion of acid in union with *ammonia*, was estimated. But as a check to this result, the third neutralised portion abovementioned was evaporated to dryness, and the muriate of ammonia expelled by heat, and collected. The quantity of muriatic acid this contained was then determined as before, and was always found to represent nearly the quantity of muriate of ammonia as before estimated; thus proving the general accuracy of the whole experiments beyond a doubt. 4. The remaining fourth portion of the original fluid was reserved for miscellaneous experiments, and particularly for the purpose of ascertaining whether it contained any other acid besides the muriatic. The experiments abovementioned



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seemed to preclude the possibility of the presence of any destructible acid; and the only known fixed acids likely to be present were the sulphuric and phosphoric; the muriate of barytes, however, neither alone, nor with the addition of ammonia, produced any immediate precipitate,* showing the absence of these two acids in any sensible quantity, and still farther confirming the results as before obtained.

In this manner the three following results, selected from a variety of others of a similar nature, were obtained.

	No. 1 grs.	No. 2 grs.	No. 3 grs.
Muriatic acid in union with a *fixed alkali*†	·12	·95	1·71
——— *with ammonia*	1·56	·76	·40
——— in a *free or unsaturated state*	1·59	1·22	2·72
Total	3·27	2·93	4·83

These results then seem to demonstrate, that free, or at least unsaturated muriatic acid in no small quantity exists in the stomach of these animals during the digestive process: and I have ascertained, in a general manner, that the same is the case in the stomach of the hare, the horse, the calf, and the dog. I have also uniformly found free muriatic acid in great abundance in the acid fluid ejected from the human

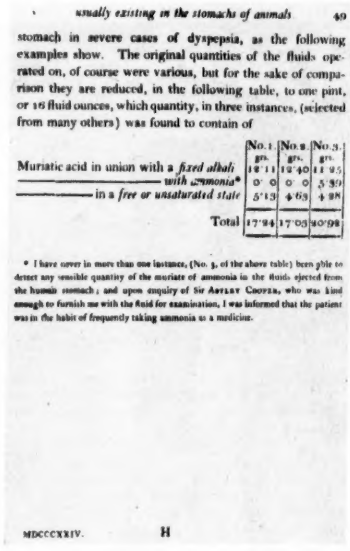
* It may be proper to remark, that ammonia, after some time, caused a flocculent precipitate, consisting of the earthy phosphates in union with vegetable and animal matter, and that after combustion, traces of sulphuric acid, the result of that process, were very perceptible. But it is evident, from the experiment related in the text, that neither of these acids previously existed in the original fluid in a free state.

† For the sake of analogy, the chlorine, in union with the basis of the *fixed* alkali, is reduced in this table a of the following to the state of muriatic acid.

Trans. Royal Society of London, 114: Part 1, pp. 45-49, 1824: Prout's original report of the discovery of free HCl in gastric juice.

gastric juice. R. D. Thomson, in 1840, gave proof of the presence of free hydrochloric acid in the stomach during in animals small doses of *alkalis* stimulate the gastric secretion and large doses neutralize the gastric juice. Leube (von

Ziemssen's Handbuch d. spec. Pathol. Vol. VII) introduced *soda solutions* into the stomachs of dogs with gastric fistula. Reference should be made to the experiments by Du Mesnil (Deutsch.



usually existing in the stomachs of animals 49

stomach in severe cases of dyspepsia, as the following examples show. The original quantities of the fluids operated on, of course were various, but for the sake of comparison they are reduced, in the following table, to one pint, or 16 fluid ounces, which quantity, in three instances, (selected from many others) was found to contain of

	No. 1	No. 2	No. 3
	gr.	gr.	gr.
Muriatic acid in union with a *fixed alkali*	12·11	12·40	11·95
——— *with ammonia**	0·0	0·0	5·30
——— in a *free or unsaturated state*	5·13	4·63	4·98
Total	17·24	17·03	40·98

* I have never in more than one instance, (No. 3, of the above table) been able to detect any sensible quantity of the muriate of ammonia in the fluids ejected from the human stomach; and upon enquiry of Sir ASTLEY COOPER, who was kind enough to furnish me with the fluid for examination, I was informed that the patient was in the habit of frequently taking ammonia as a medicine.

MDCCCXXIV. H

Prout's report of discovery of free HCl in gastric juice, last page.

med, Wochenschr., 1892), and Linossier and Lemoine (Acad. de Méd. de Paris, Session March 28, 1893).

COMPLICATIONS FOLLOWING USE OF ALKALIS

All of us, at some time during the past quarter of a century, since the appearance of the Sippy form of treatment (1912-1915), have met some patients with ulcer suffering from subclinical alkalosis and perhaps some with alkalemia and toxic manifestations. These phenomena are discussed by Wilfrid Oakley (July 27, 1935) who concludes, "The treatment of peptic ulcer by *alkalis* and diet is occasionally complicated by the occurrence of certain symptoms associated with urinary changes and a rise in the alkali reserve and blood urea. The amount of alkali required to produce alkalosis is usually large . . . but symptoms may result from smaller doses, especially if there is severe or continued vomiting. In the late stages of alkalosis patients may die in spite of treatment." Hardt and Rivers, of Rochester, Minnesota (1923), state, "It has been our experience in this particular group (ulcer cases difficult or almost impossible to control the acidity) with one exception, that when an attempt is made to control the acidity, symptoms of toxemia usually appear." Hardt states that patients whose gastric acidity persistently remains uncontrolled may show symptoms early—such as headache and nausea, tightness in the back of the head, irritability, dizziness, vertigo, vomiting, aching in the joints and muscles—and may develop a dislike for milk, complaining that milk is distasteful or "sour." These authors conclude that patients with duodenal ulcer treated *by the Sippy method* may develop definite symptoms of toxemia associated with renal changes, increased blood urea, and normal or increased carbon dioxide combining power of the plasma. Patients with duodenal ulcer and renal complications are inclined to develop toxic manifestations to a much *greater* degree.

Sodium Bicarbonate. Sodium bicarbonate freely used in large doses for long periods of time impedes the normal liberation of oxygen by the circulating blood due to its pleionectic* action on hemoglobin. The pleionectic tendency of sodium bicarbonate leads to anoxemia, as demonstrated by Barcroft (1914), confirmed by MacLeod (1921), and emphasized by Latchford (1938).

The ill effects of the use of bicarbonate of soda in some of these cases have been previously noted by Grant (1922), Hardt and Rivers (1923), Hurst, Houghton, Venables and Lloyd (1925),

**Pleionexy* (Latchford) is that condition of the circulating hemoglobin in which it holds on more firmly to its gathered oxygen than in the normal condition (mesonexy), and so gives off less oxygen to the tissues than normally. With the onset of pleionexy, anoxemia develops, which may kill the organism.

Gatewood (1927), Carr (1932), Steele (1937), Wang (1938), Latchford (1938), Falconer and Lyall (1938), C. Wesley Eisele (June, 1939), and others. Eisele states [Arch. Int. Med. 63: No. 6, 1048-1067 (June) 1939], "In all patients receiving alkali therapy some degree of chemical alkalosis develops, but clinical alkalosis develops in few."

Howland and Marriott (1918), and Harrop (1919) reported toxic manifestations and the occurrence of tetany from the use of sodium bicarbonate. Studies by Kellogg and Mettier (Aug., 1936), of San Francisco, indicate that in some types of anemia due to chronic blood loss from peptic ulcer, the *alkalinization* process associated with a Sippy regimen *inhibits the absorption of iron* contained in food. Pohle and Heath (April, 1939), of Boston, have made an interesting study of the influence of acid and alkaline salts upon the blood in hypochromic anemia treated by iron parenterally.

Other remedies have been suggested by Greenwald (1923), Kantor (1923), Mutch (1936, 1937), Mann (1937), Tidmarsh and Baxter (1938), Kraemer (1938), Winkelstein, Woldman and Rowland, W. A. Swalm, Eusterman, Whitcomb (1939), and others.

ALUMINUM HYDROXIDE

Woldman and Rowland (1936) state that *aluminum hydroxide* seems to have a deterrent effect on the secretion of acid, in addition to the neutralizing value it possesses. Aluminum hydroxide is an amphoteric substance, adsorbing acid in the gastric acid medium and giving it up in favor of alkalies when it passes into the duodenum.

Hollander (1939) well states, "For the purpose of retarding or eliminating ulcer formation, pepsin digestion as well as the erosive influence of free hydrochloric acid must be eliminated, and both of these can be excluded simultaneously by elevating the *p*H to 5.0. Complete neutralization of all organic acids (i.e., to a *p*H of 7.0) is not necessary, nor does it offer any obvious additional benefits."

IOANES SCHENCKIVS A GRAFENBERG
MEDICVS SENIOR ANN AETATIS LXV
Nulla pol. tacebit aetas nomina famam tuj,
Docte SCHENCKI, Pergamis plene Mysta numine:
Puelicam cernice quod rem fulcias fatricam,
Cum tui Artis hinc et inde congeris magnalia.
Car. Sponius D.M.

Joannes Schenck a Grafenberg (1530-1598).

DE VLCERIBVS VENTRICVLI.

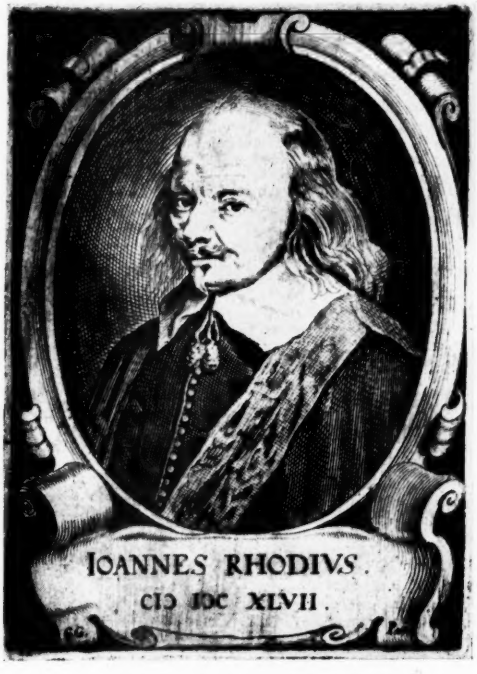
OBSER.

J. Schenck, 1595, Ed., Friburg.

This can be accomplished by the combined antacid formula suggested by the writer.

ANTACID THERAPY

The use of *magnesium trisilicate, colloidal kaolin,* and *aluminum hydroxide,* in combination, has given good results. In cases with considerable pyloric spasm and obstructive symptoms it is helpful to use antispasmodic remedies in rather liberal doses. Included among these are belladonna, atropin, novatropin, papaverin, perparin, nitroglycerin, with or without the use of phenobarbital or some similar remedy. In the more severe cases, the free use of such antispasmodics will prevent, in good measure, any possible tendency to marked retention.



Joannes Rhodius (1587-1659).

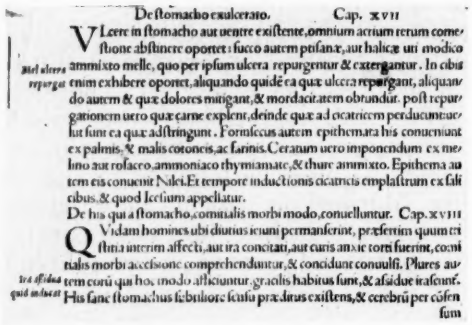
Several hundred cases have been treated satisfactorily with this form of antacid therapy in private practice and in some large hospital clinics. The formula (trisilicate of magnesium, 50 per cent; colloidal kaolin, 25 per cent; and aluminum hydroxide, 25 per cent) was used in powder, capsules and tablets. Each patient received a liberal bland diet, with intermediate feedings of milk, or powdered whole milk and water, every two hours from 8 a. m. to 10 p. m., and eight drams of the formula (daily). One or two drams of this preparation were given before each of the main meals and one dram, before the milk feedings in the mid-morning, mid-afternoon and at bedtime. Frequently, these patients received an extra dose during the night, if they awakened. Those suffering with marked pylorospasm and severe pain were given novatropin, perparin and phenobarbital for prompt relief. Many of the patients were relieved, however, following the administration of the antacid formula in from three to five days.

Particularly useful is this form of antacid therapy in postoperative cases to prevent further hyperacidity and the possible occurrence of postoperative gastrojejunal ulcer. Fauley, Ivy, et al. prevent postoperative jejunal ulcer (Feb. 1939), and Woldman and Polan, Woldman and Rowland, B. B. Whitcomb and others have reported favorable results from the use of colloidal aluminum hydroxide in peptic ulcer therapy.

Surgeons must always be good physicians. It is highly advisable, even after the gastroenterologist, or the general practitioner of medicine, or the internist, has referred his ulcer patient to the surgeon, that during the period of further observation and before approaching the treatment of the ulcer surgically, a short *course of antacid therapy should again be tried by the surgeon* (except, of course, in emergency cases with acute surgical complications). If this medical treatment (by the surgeon) fails, surgery should be resorted to without further delay. The surgeon, in the interest of the patient, will make every effort to prevent the development of postoperative hypersecretion and gastrojejunal

ulcer by suggesting *immediate antacid therapy*. The use of the above combination is suggested.

These few comments are published by the writer in the hope that others interested may give this combined form of antacid therapy a fair trial. It appears to the writer and to many of his colleagues that many of the patients suffering from ulcer, with marked hyperacidity, are promptly given appreciable relief, with definite evidence of rapid healing following the control of the acid secretion.



De stomacho exulcerato. Cap. XVII

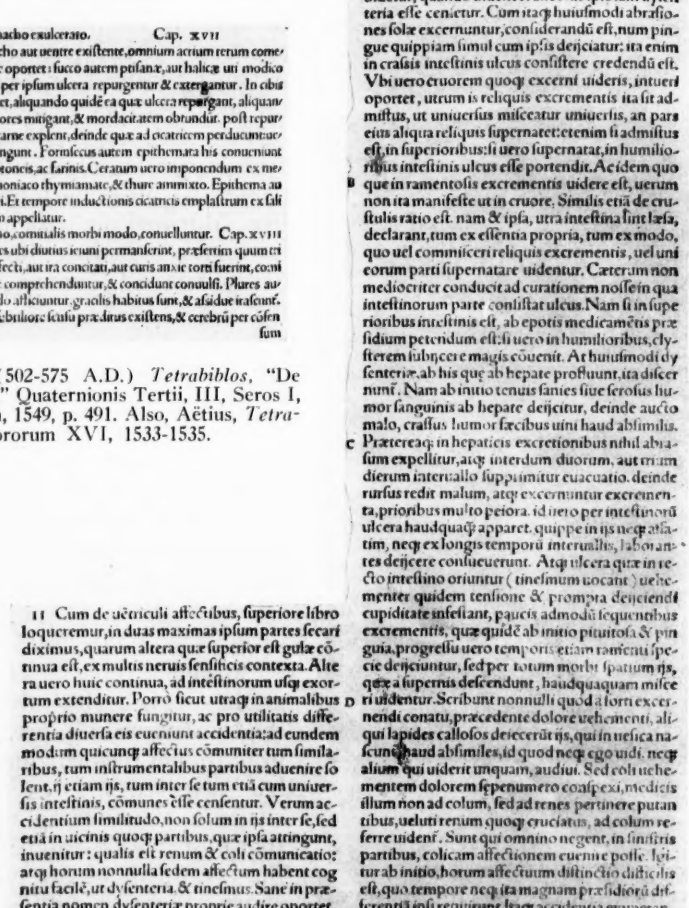
VLcere in stomacho aut uentre existente, omnium actuum rerum comestione abstinere oportet: succo autem psyllæ, aut halicæ uti modico ammixto melle, quo per ipsum ulcera repurgentur & exterguntur. In cibis enim exhibere oportet, aliquando quidē ea quæ ulcera repurgant, aliquando autem & quæ dolores mitigant, & mordacitatem obtundūt. post repurgationem uero quæ carne explent, deinde quæ ad cicatricem perducunt: uelut sunt ea quæ astringunt. Formicum autem epithemata his conueniunt ex palmis, & malis cotoneis, ac farinis. Ceratum uero imponendum ex melino aut rosaceo, ammoniaco thymiamate, & thure admixto. Epithema autem eis conuenit Nili. Et tempore inductionis cicatricis emplastrum ex salibus, & quod Iectium appellatur.

De his qui a stomacho, comitalis morbi modo, conuelluntur. Cap. XVIII

QVidam hominum ubi diutius iciuni permanserint, præsertim quum eis stina interim affecti, aut ira concitati, aut curis animi torti fuerint, comitialis morbi accessione comprehenduntur, & concidunt conuulsi. Plures autem eorū qui hoc modo afficiuntur, gracilis habitus sunt, & assidue iracundi. His sane stomachus sebuliore sensu præditus existens, & cerebrū per cōsensum

Ira assidua quid inducat

Aëtius Amidenus' (502-575 A.D.) *Tetrabiblos,* "De stomacho exulcerato," Quaternionis Tertii, III, Seros I, Caput XVII, Froben, 1549, p. 491. Also, Aëtius, *Tetrabiblos,* Librorum XVI, 1533-1535.



DE LOCIS AFFECTIS

A diximus, heri solet: atq; proprias etiam habet notas. Etenim protinus ab ipsius initio bilis mordax secernitur, quam deinde interaneorū abrasiones sequuntur, poitea paulum cruoris simul excerni uidetur, quando uidelicet affectus ipse iam dysenteria esse cenſetur. Cum itaq; huiusmodi abrasiones solæ excernuntur, considerandū est, num pingue quippiam simul cum ipsis deijciatur: ita enim in crassis intestinis ulcus consistere credendū est. Vbi uero cruorem quoq; excerni uideris, intueri oportet, utrum is reliquis excrementis ita sit admistus, ut uniuersus misceatur uniuersis, an pars eius aliqua reliquis supernatet: etenim si admistus est, in superioribus: si uero supernatat, in humilioribus intestinis ulcus esse portendit. Ac idem quo

B que in ramentosis excrementis uidere est, uerum non ita manifeste ut in cruore. Similis etiā de crustulis ratio est. nam & ipsa, utra intestina sint læsa, declarant, tum ex essentia propria, tum ex modo, quo uel commiscerī reliquis excrementis, uel uni eorum parti supernatare uidentur. Cæterum non mediocriter conducit ad curationem noſſe in qua intestinorum parte consistat ulcus. Nam si in superioribus intestinis est, ab epotis medicamentis præsidium petendum est: si uero in humilioribus, clysterem subijcere magis cōuenit. At huiusmodi dysenteriæ, ab his quę ab hepate profluunt, ita discernuntur. Nam ab initio tenuis sanies siue serosus humor sanguinis ab hepate deijcitur, deinde aucto malo, crassus humor sæcibus uim haud absimilis.

C Præterea q; in hepaticis excretionibus nihil abrasum expellitur, atq; interdum duorum, aut trium dierum intercallo suppurātur euacuatio. deinde rursus redit malum, atq; excernuntur excrementa, prioribus multo peiora. id uero per intestinorū ulcera haudquaq; apparet. quippe in ijs neq; assatim, neq; ex longis temporū interuallis, laborantes deijcere consueuerunt. Atq; ulcera quæ in recto intestino oriuntur (tinesmum uocant) uehementer quidem tensione & prompta deijciendi cupiditate infestant, paucis admodū sequentibus excrementis, quæ quidē ab initio pituitosa & pinguia, progressu uero temporis etiam rarefacti specie deijciuntur, sed per totum morbi spatium ijs, quæ a supernis descendunt, haudquaquam misceri uidentur. Scribunt nonnulli quod a forti excernendi conatu, præcedente dolore uehementi, aliqui lapides callosos deiecerūt ijs, qui in uesica nascuntur, haud absimiles, id quod neq; ego uidi, neq; alium qui uiderit unquam, audiui. Sed cōi uehementem dolorem sępenumero conspexi, medicis illum non ad colum, sed ad renes pertinere putantibus, ueluti rerum quoq; cruciatus, ad colum referre uident. Sunt qui omnino negent, in sinistris partibus, colicam affectionem euenire posse. Igitur ab initio, horum affectuum distinctio difficilis est, quo tempore neq; ita magnam præsidiorū differentiā ipsi requirunt. Itaq; accidentia exuperantia, etiam tunc diligenter intueri oportet. Nam & nausea, & uomitus urgent, multo grauiores, et magis assidui, dolente colo. Euomuntq; ita laboran-

tes

D 11 Cum de uētriculi affectibus, superiore libro loqueremur, in duas maximas ipsum partes secari diximus, quarum altera quæ superior est gulæ cōtinua est, ex multis neruis sensificis contexta. Altera uero huic continua, ad intestinorum usq; exortum extenditur. Porro sicut utraq; in animalibus proprio munere fungitur, ac pro utilitatis differentia diuersa eis euenīunt accidentia: ad eundem modum quicunq; affectus cōmuniter tum similaribus, tum instrumentalibus partibus aduenire solent, ij etiam ijs, tum inter se tum etiā cum uniuersis intestinis, cōmunes esse censentur. Verum accidentium similitudo, non solum in ijs inter se, sed etiā in uicinis quoq; partibus, quæ ipsa attingunt, inuenitur: qualis est renum & coli cōmunicatio: atq; horum nonnulla sedem affectum habent cognitu facilē, ut dysenteria & tinesmus. Sane in præsentia nomen dysenteriæ proprie audire oportet, utpote quōd ex appellatione ipsa, intestinorū ulcus significat. Neq; enim aſſatim fit huiusmodi affectus, id quod in eo quem hepatis uitio accidere

Cl. Galen, "De Locis Affectis," (VI) Liber sextus, Column 139, Cap. III, "Galeni De Affectorum Locorum Notitia," in *Galeni Operum Tertius Tomus Classem Scriptorum,* Basileae, 1549, Froben. (Cl. Galen, Sept. 22, 130 A.D.-200 A.D.?)

To summarize, physicians and surgeons, treating ulcer patients, have at various times seen patients who, *under prolonged (systemic) alkaline therapy,* show apathy, twitchings, convulsions and coma, even death occurring in rare instances. The more common clinical symptoms of *alkalosis* are a definite dislike for milk, headache, dizziness, anorexia, nausea, vomiting, irritability, aching pains in the muscles and limbs, drowsiness, dryness of the tongue and mouth, diuresis (in the early stage of alkalosis), deep coma (in the late stage), and tetany (rarely). Such *symptoms of alkalosis do not occur* from the use

De cibo et potu.

Dimittendi ſunt cibi omés qui ſunt difficilis digeſtionis ut panis agimus aut nó bene coctus cibaria de paſta et omnia corpora legumi num. unde Gali. in cómento amphor. ubi in digentia q̄ helenes pp indigentiā legumina comedebant ſecuta eſt eis pedū debilitatio. Dimittat carnes groſſas et bouinas etc. Et carnes omniū auium ītraqua degentiū et ſa/ litas omnes. et carnes habentes multas humi ditates ut agnine. et capita quadrupedū et ui/ ſcera ſpſorū. et caſeus et lac et quecūq̄ ex lac te ſiunt. Nocent piſces omnes lacuales ut tenche anguille gambari et ſimiles et piſces magnorū corporū ut ſtoriones toni et ſimi/ les. Et herbe complexionis frigide et humi/ de ut ſpinacia lactuca portulaca etc. Et nutri/ menta omnia facilis corruptionis ut ſunt om nes fructus que apud grecos orarii dicuntur ut melóes citrulli cucurbita ceraſa pruna mo ra criſomila pira mela uernalia una ficus re/ centes et omnes fructus ante maturationem. Priuſquā ad electionē ciborū deſcendā que/ dam regule ſunt premittende. Prima non é comedendū niſi affuerit uera et naturalis fa/ mes patet quia ſi cibus aſſumitur ſine naturā li appetitu ſignificat aut q̄ cibus preaſſump/ tus non eſt digeſtus aut q̄ ſtomacus é malis humoribus repletus indigentibus maturatio ne. Secūda non differat comeſtio dum uerus affuerit appetitus patet quia tollerare famem ſtomacus malis replet humoribus. Tertia dū appetitus fuerit intenſus nō comedatur uſq; ad ſacietatē. Quarta non eſt comedēdū ſi in ſtomaco ſētiur faſtidiū quoniā generat mor/ bos flegmaticos. Quinta ſubtilia cibaria pre mitti debent groſſis. Sexta menſura cibi et potus talis et tanta ſit ut ex eis non grauetur ſtomacus deterior comeſtio eſt que ſtomachi grauitatē facit ſicut deterior potus eſt qui ſēt peramentū egreditur et in ſtomaco natat. Se ptima quouſq̄ ex cibis aſſumptis aut poti/ bus ſentitur grauitas in ſtomaco a cibo abſti nendum é dum donec conſequetur leuitas. Octaua dū in ſtomaco ſentit debilitas a mul

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ta comeſtione eſt abſtinendū etiam ſi multus eſſet cibus neceſſarius patet quia eſſet audere debilitatem ſtomaco debili. Nona ſtante de/ bilitate ſtomaci cum neceſſi. multe cibationis cibus eſt petendus in plures ptes et cibus et potus qui tunc adminiſtrantur debent ee me diocriales ut ſuis qualitatibus contrarient cir ea facienti ſtomaci debilitate omnes iſte regu le colliguntur tertia primi de regimine eius q̄ comeditur et bibitur.

¶ Panis ſit de formento bene mundo bona meſſe collecto ſit debite fermentatus et medi/ ocriter coctus colore canditus pondere leuis ſubſtantia non compactus aliqualiter ſalsus etatis unius aut duorum dierum.

Ex carnibo eligant. ex aulbo pullorū gallina rū caro gallinarū é oi carne melior. xxiiii. cō t nētis. caponū faſianorū francolinorū perni cū turturū pipionū uolare incipiētū pulli cu lumborū dant in cibo illi cuius corpus eua/ cuatū é de ſanguine et infridatū ex lōgo mor bo. xxiiii. cōtinētis. et olim puerū auiū degen tū in praris et nemoribo. Ex quadrupedibo caſtrati edi uituli caprioli. ipſe. n. inter ſilue ſtras carnes meliores exiſtit et ſāguis ex eis genitus paucas habet ſuperfluitates. iii. alman foris. leporis conculi. Ex pribus alaliū eligā tur anteriores. Oim eni alaliū anteriora cali diora ſunt et digeſtioni meliora poſteriora ue ro ecōtra yſaac in dietis ptcularibo. Caro ru bea muſculoſa olbus aliis melior exiſtit et pi prie cū nō fuerit multa pinguedine cōfuſa de q̄ ab ea totaliter deoudata. pingues excellen tes carnes nutrimētū exhibēt humidū et mul tarū ſuperfluitatū. De mō prepandi carnes dicendū eſt. premittēdo primo q̄ oim anima liū habentiū corpa groſſa ſolida et macra. carnes eliſſe meliores ſunt quā aliter prepate Secundo q̄ uolatiliū pinguium carnes aſſa/ te ſunt meliores quam alliſſe macrorum econ tra. Tertio q̄ ſuperficies aſſatorum cum fuer rit torrefacta cum lardone incenſo non conue nit. Quarto q̄ caro aſſata quando fuerit p modum ſuffocationis in uaſe reſeruata nullo modo comedantur tales reponuntur in ſpecie ueneni. Sexta quarti inter ceteras prepatio/ nes carnium elliſſata eſt melior ſi fuerit bene cocta. Caro aſſata conueniens eſt ſi bene di/ geritur. Sed quia tarde digeritur non de bet ex ea multa fieri replecio. Caro cum pin guedine frixa faſtidiū generat ſtomacū nau/ ſeare facit caput grauat neruos remollit gra/ uioris digeſtionis quā aſſata ſuper prunas Carnes in furno aſſate uel ſuper gratieulas preparate licet digeſtionis graues exiſtant.

Baverius (1406?-1480), "De Cibo et potu."

slow respiration, flushed face, profuse perspiration, weakness and prostration, of the above described nonsystemic antacid and adsorbent therapy.

II. HISTORICAL NOTES AND CONNOTATIONS

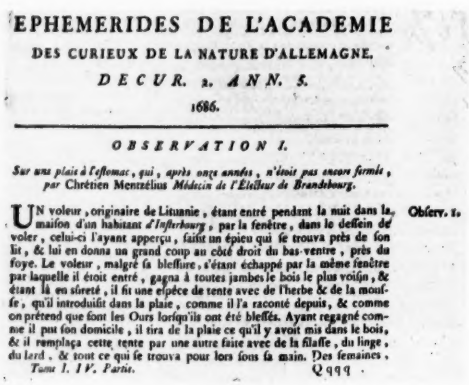
It is of interest, historically, to note that gastric disorders associated, no doubt, with hyperacid states were treated in Hippocratic and Talmudic times. Those of us who have studied the fascinating and lengthy story of ulcer of the stomach and duodenum realize that it goes back, perhaps, to the neolithic or alluvial Period (3000-1500 B. C.) and the early Egyptian days, centuries before the compilation of the Papyrus Ebers (circa 1500 B. C.). The medicine men of Homer's (900 B. C.) times, and perhaps the "good physicians both," Machaon and Podalirius (sons of Aesculapius) of the Iliad; Hippocrates (460-370 B. C.); Celsus (20 A. D.); Galen (130-200 A. D.) and the other ancients knew of gastric disease and ulcer of the stomach. Aëtius Amidenus (502-575 A. D.), in his medicinal "Tetrabiblos," Froben, 1549 (Quaternionis Tertii III: Sermo Primus I, et Ex ordine nonus (IX), Caput XVII, page 491) discusses "De stomacho exulcerato" and speaks of "*Ulcere in stomacho* au ventre existente, etc." Avicenna (980-1036 A. D.) treated ulcer of the stomach ("Canonis medicinae," Venice, Press of Petrus Maufer, 1486, Liber III, Fen. XIII, Tract. IV, Capitulum XII, "De vulneribus i stomacho"; "Stomacho . . . ulcera . . . "; and Capitulum XIV, "De cura ulcerum stomachi").

Galen (130-200 A. D.), in his "De locis affectis," Liber V, Cap. 6, on pathology, mentions ulcer of the stomach.

This same writer, in "De locis affectis," Liber 6, Column 139, Cap. II (Basileae, 1549), says, "Cum de ventriculi affectibus superiore libro loqueremur in duas maximas ipsum partes secari, diximus: quarum altera quae superior est, gulae continua est, ex multis nervis sensificis Contexta: altera vero huic continua ad intestinorum usque exortum extenditur."

Everard Home (Philosophical Transactions, London, 1807) also divides the stomach into two parts: cardiac and pyloric.

Celsus (20 A. D.), in his "De Medicina" (printed 1478), Liber IV, Cap. 5, lays down rules for its treatment, acceptable even today. "Adhibendi lenes et glutinosi cibi sed citra satieta-



EPHEMERIDES DE L'ACADEMIE
DES CURIEUX DE LA NATURE D'ALLEMAGNE.
DECUR. 2. ANN. 5.
1686.

OBSERVATION I.

Sur une plaie à l'estomac, qui, après onze années, n'étoit pas encore fermée, par Chrétien Mentzélius *Médecin de l'Electeur de Brandebourg.*

UN voleur, originaire de Lituanie, étant entré pendant la nuit dans la maison d'un habitant d'Inſterbourg, par la fenêtre, dans le deſſein de voler, celui-ci l'ayant apperçu, ſaiſit un épieu qui ſe trouva près de ſon lit, & lui en donna un grand coup au côté droit du bas-ventre, près du foye. Le voleur, malgré ſa bleſſure, s'étant échappé par la même fenêtre par laquelle il étoit entré, gagna à toutes jambes le bois le plus voiſin, & étant là en ſûreté, il fit une eſpéce de tente avec de l'herbe & de la mouſſe, qu'il introduiſit dans la plaie, comme il l'a raconté depuis, & comme on prétend que font les Ours lorſqu'ils ont été bleſſés. Ayant regagné comme il put ſon domicile, il tira de la plaie ce qu'il y avoit mis dans le bois, & il remplaça cette tente par une autre faite avec de la filaſſe, du linge, du lard, & tout ce qui ſe trouva pour lors ſous ſa main. Des ſemaines,

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des mois, & des années s'écoulérent enſuite, ſans qu'il pût parvenir à faire fermer cette plaie, parce que les bords en étoient devenus calleux. Il ne ſurvint cependant à cet homme aucun ſymptome fâcheux. Ayant ainſi porté la peine de ſon crime pendant l'eſpace d'onze ans, il ſe répandit dans le public qu'il faiſoit ſortir par une plaie qu'il avoit à l'eſtomac, les alimens qu'il contenoit, & qu'en introduiſant le doigt dans l'ouverture de cette plaie, on pouvoit juger du degré de chaleur de l'eſtomac; de ſorte qu'il ſe faiſoit voir pour de l'argent. L'Electeur de Brandebourg qui étoit alors jeune, & qui faiſoit la viſite de cette Province, ayant ouï parler de cet homme, eut la curioſité de le voir, & l'ayant fait venir, il lui raconta fort naturellement ſon avanture, lui fit voir ſa plaie, & en fit ſortir, en ſe preſſant le ventre, une certaine quantité d'alimens à demi digérés qui commençoient déja à avoir une mauvaiſe odeur. Comme le Médecin du Prince étoit préſent, & qu'il douroit encore de ce qu'il voyoit, il lui fit avaler en ſa préſence un certain breuvage coloré, & cet homme l'ayant fait ſortir par la plaie, tel qu'il l'avoit pris, ce Médecin fut obligé de convenir de la vérité du fait, qui a été atteſté à l'Académie par l'Electeur de Brandebourg.

Notes ſur cette obſervation, par le même Auteur.

Cette obſervation peut être de quelqu'uſage en Médecine, puiſqu'elle nous apprend que toutes les plaies de l'eſtomac ne ſont pas toujours mortelles. Car quoique celles des membranes ſoient très-difficiles à guérir, & que l'eſtomac ſoit un viſcére membraneux, l'expérience cependant des anciens Médecins, tels que *Galien*, *Alimeyde*, *Chriſtophle de Vega*, *Fallope*, *Schenkius*, &c. & même des modernes, fait connoître qu'on ne doit pas toujours regarder les plaies de l'eſtomac comme incurables, ſoit qu'elles ayent été faites par accident ou à deſſein, ſur-tout ſi ces plaies ne ſont pas dans une partie nerveuſe, & près de l'orifice ſupérieur, mais plus bas, & qu'elles ayent été faites obliquement, comme étoit la plaie dont on vient de parler, & celle dont on va rapporter l'hiſtoire. Le 19. Mai 1676. *Nerveus Ayrh*, un homme de la campagne ayant voulu s'exciter à vomir, en ſe chatouillant le fond de la gorge avec le manche de ſon couteau qui étoit un peu recourbé, le couteau lui échappa, gliſſa dans l'œſophage, & de là dans l'eſtomac. Le neuf Juillet, de l'avis de tous les Médecins de *Konigberg*, aſſemblés, on fit une inciſion à la partie latérale gauche de l'eſtomac de cet homme, on en tira le couteau, & on parvint à faire cicatriſer la plaie. *V.* l'Ouvrage de *Daniel Becher* ſur ce fait extraordinaire, publié en 1683. Ce payſan vivoit encore en 1686. je le vis alors à *Konigberg* où je faiſois mes études; & depuis cette opération, il s'étoit marié & avoit eu des enfans. La pointe du couteau que cet homme avoit avalé, avoit été un peu rongée dans l'eſtomac.

Above and right, Mentzelius' Case.

tem; omnis acria atque acida removenda; vino utendum, sed neque praefrigido neque nimis calido." Thus, it is noted that Aulus C. Celsus (circa 35 B. C. — 25 A. D.?) prescribed a *special ulcer diet* (1900 years ago), which should be

REMBERT DODONÉE.

REMBERT DODONE'E eſtoit fils de Denis Dodonée, Friſon, vulgairement nommé Dodoens. Il nâquit à Malines le vingt-neufiéme de Juin de l'an mille cinq cens dix-huit, & fut envoyé aſſez jeune à Louvain, où il fit des progrez ſi conſiderables dans l'eſtude de la Medecine qu'il fut à l'age de dix-ſept ans jugé digne du Doctorat. Ayant receu cette marque glorieuſe de ſa ſuffiſance il quitta l'Univerſité, reſolu de viſiter celles de l'Allemagne, de la France, & de l'Italie; afin d'en reconnoiſtre les maximes, & de ne rien ignorer de tout ce qui pouvoit le rendre illuſtre en ſa profeſſion. Comme il n'avoit

N 2 point

Above, Dodonaeus (1517-1580). Right, his "De

larum Et Consultationum Medicinalium, Editio Tertio, Venice, 1592, Liber V, Epistola V, pp. 57-58, on 58 F.].

Among the earliest reports on gastric and duodenal ulcer, perforation and fistula, etc., were those made by L.

De Vlcere ventriculi.

CAPVT XXV.

EXVLCERARI ventriculum non minus quàm alias corporis partes, à ratione haud alienum eſt.

Honeſta quædam matrona, annos (plus minus) LX. nata, ex ore ſpiritum fœtentem multis emiſerat annis: è naribus graueolens quoque muccus cõcretus ſubinde extrahebatur, virens aut omninò varij coloris: dolor circa ventriculi regionem aſſiduus, non tamen valdè moleſtus; vt, quem lenire poterat ſacculus, in quo herbæ, ſemina, & aromata quædam, ventriculo commoda, vnà cum goſſipio conſuta erant. Mens & ſenſus ad extremum conſtiterunt: longo morbo confecta è vita diſceſſit.

Ventriculus huius exterius ab omni parte ſuperficietenus exulceratus exitit, & quæ ipſum contingebant vniuerſa, non tamen alia, quàm qua ventriculo contigua erant parte. Cerebri ſubſtantia integra, ſed copioſo admodum humori veluti innatans: qui fomes eſſe potuit mucci, qui ſæpè in naribus concreuerat.

Ulcere Ventriculi" in *Medicinalium*, 1581.

glutinous. *Acid and acrid substances must be avoided.* Wine may be taken, but not too hot or too cold!

Horatius Augenius (1527-1603) does not discuss ulcer or perforation of the stomach, but does consider gastric digestion and its disturbances [Epistola

Phryesen (Fries, 1518), Rembert Dodonaeus (1581), Marcellus Donatus (1586), Johannes Schenck (1530-1598), Mathias C. Cornax (born circa 1520), Alcmarianus Petrus Forestus (1522-1597), Felix Plater (1534-1614), Petri Borell in 1670 (1620-1689),

Christianus Mentzelius (1686), T. Bonetus (1679), J. Rhodius (1676), Fehrius (1689), S. Grassius (1695), Johannes M. Vorwaltner (1699), Alexis Littre (1704), Rudolph J. Camerarius (1717), Johannes A. Goerizius (1719), J. J. Courtial (1688), Du Verney (1704), S. J. P. Housset (1693), M. Preusius (1719), Christopher Rawlinson (1729), August Wencker (1735), Morgagni (1737), Christian Wencker (1743), Janus Plancus (1748), J. F.

Henckel (1712-1779), J. B. Verduc, Jacobus Hollerius Stempanus (died 1562), Joannes Scultetus (1595-1645), Domenico Panaroli (1654), C. Stalpart van der Wiel (1727), P. Salmuth, O. Desnoz (1759), Vetter, Westring, Jacquinelle, Laporte (1772), du Rocher (1745), Lieutaud, Hallé (1802), Citizen Bellot (1802), Jacopo Penada (1793), Matthew Baillie (1793), J. Muralto, B. Gooch, H. Bassius (1731), Godot (1773), Smyth (1790), Jean Cruveilhier (1791-1873) and Abercrombie (1824).

The case of Cardinal Cesare Baronius (died June, 1607), as reported by Paul Freher (1688) (*Obiit ex ulcere stomachi*: "In cadavere dissecto Medici tria ulcera in ore ventriculi invenerunt, unde rebellis ejus nauseae sedatus fuit stupor"), is entirely overlooked by present day writers.

Other early reports were by C. G. G. Kade (1752), Fearon, D. W. Nebel (1782), J. Morin (1800), Citizens Corvisart and Leroux (1802), Lassus and Percy (1802), Lorey (1808), Percy and Laurent (1819), Amedée Lefevre

Cum in ſenectute lethalem contraxiſſet nauſeam, adeò, ut inſenſibili alimenti portione ſuſtentari videretur, ſeptuageſimum tamen ſuperſuit annum, quo XIImum *Sacræ Hiſtoriæ Librum* ex voto complevit.

Obiit ex ulcere ſtomachi.

Fato defunctus eſt *Romæ* ult. die Junii A. C. 1607. In cadavere diſſectoMedici tria ulcera in ore ventriculi invenerunt, unde rebellis ejus nauſeæ ſedatus fuit ſtupor.

Sepultus jacet *Romæ* in Templo Congregationis Oratorii cum hoc Epitaphio, Cardinali *Franciſco Mariæ Tauruſio* communi:

Caesar Baronius Cardinalis, Obit. Junii A.C. 1607. Paul Freher, Theatrum Virorum, 1688, Noribergae.

(1842), Anton J. R. Jacksch (1844), C. Rokitansky (1836, 1839), Coze (1790), Breschet, Aillaud, Baron, J. J. Leroux [Observation sur une perforation de l'estomac, Jour. de Méd., Chir., etc., Paris, 15: 239-249 (Apr.) 1808], Van Swieten (1700-1772), and Adamus Christianus Thebesius (1715).

Many of these early recorded cases of gastric and duodenal ulcers, perforations and gastric fistulae have been overlooked entirely by American and English students of the subject.

SIXTEENTH CENTURY REPORTS

Dodonaeus (1517-1585), under the title "*De Ulcere Ventriculi*" (1581) reported the case of "Honesta quaedam matrona, annos (plus minus) LX. nata, ex ore spiritum foetentem multis emiserat annis: . . . dolor circa ventriculi regionem assiduus, non tamen valdè molestus; . . . *Ventriculus* huis exterius ab omni parte superficietenus *exulceratus* extitit . . . " [Medicinalium Obser-

vationum, Caput XXV, pp. 61-62, Anno 1581, Apud Viduam, Thomae Henrici.]

One may also read Constantinus Africanus — Incipit liber Constantini *de stomacho*, in: Isaac Judæus, "Opera Omnia," CLXXVIII-CLXXXVI, 1515, Lugduni; the review of August Wencker's report (Strasbourg, 1735) concerning "une Fille qui a depuis vingt trois ans, l'estomac percé", which appears in the Journal Des Scavans, Tome CXII: 534-543, August 1737, Amsterdam, Jansons a Waesberge (Dissertatio Medica sistens Observationem rariorem de Virgine ventriculum, per viginti tres annos perforatum habente. Autore Augusto Wencker Argentino. Argentorati, Typis Melchioris Pauschingeri, Typographi).

Camillus Facinus, temperamento bilioſo præditus ætatis ſuæ anno quinquageſimonono tertiana febre laborauit, qua extincta, malè coloratus, cum manifeſto lienis tumore, atque hepatis obſtructione remanſit, & ita valetudinarius inordinato regimine vita uſus, rurſus in febrem incidit ad malum habitum corporis deductus, in cuius inuaſione paraxiſmi euomere cœpit, ſicque tertia die poſt cibi aſſumptionem per horas tres, vel quatuor cibum, & potum maximæ pituitæ copia permixtum euomuit, quod & ſingula quaque die poſtea fecit donec occubuit, nec minus ad trium librarũ pondus pituitæ euomebat qualibet uice, multotiens ad quinque aſcẽdebat librarum pondus, quo tempore nunquam per inferiora quicquam excreuit, & ſi clyſteres acres, & mites quoque ingeſti fuerint, ac per ſuperiora ſoluentia medicamenta ſorpſerit, quæ tamen euomuit, interim de dolore circa fundum uentriculi conquerebatur, ſicque ad quartam vſque diem bis quotidie euomendo perſeuerans vitam cum morte commutauit. Cadauer à nobis diſſectum annuentibus filio, & vxore hæredibus, atque in ima ventriculi regione

De Medica Historia Mirabili, Mantua, 1581, Marcellus Donatus (1540?-circa 1600): The case of Camillus Facinus.

The case of Donatus, of Mantua (1586) appears in his "De Medica Historia Mirabili":

"*Camillus Facinus*, a man of a bilious disposition, suffered at the age of 59 years from a certain fever. When that was cured, he was left with a bad colour, and was found to have a swelling of the spleen and an obstruction of the liver. While in this feeble condition, through careless regulation of his habits, he developed the fever once more and was reduced to a bad state of health. On the outbreak of this malady he began vomiting, so that on the third day, after taking food, for three or four hours he vomited what he had eaten and drunk, together with a great quantity of liquid matter, which was repeated on each subsequent day until his death. On every occasion he vomited no less than three pounds of phlegm, and frequently the amount reached as much as five pounds. During this time he never excreted anything by the lower channels, although purgatives, both violent and mild, were injected, and he took laxative medicines through the upper channels; these, however, he vomited. Meanwhile, he complained of pain about the base of the stomach, and thus he continued, vomiting twice daily, till the fourth day, when he passed from life to death. The body was dissected by us with the consent of his wife and sons, who were his heirs, and in the lower part of the stomach at the pylorus or lower orifice we found that the inner coating was ulcerated, and we had no doubt that this had been the cause of the malady."

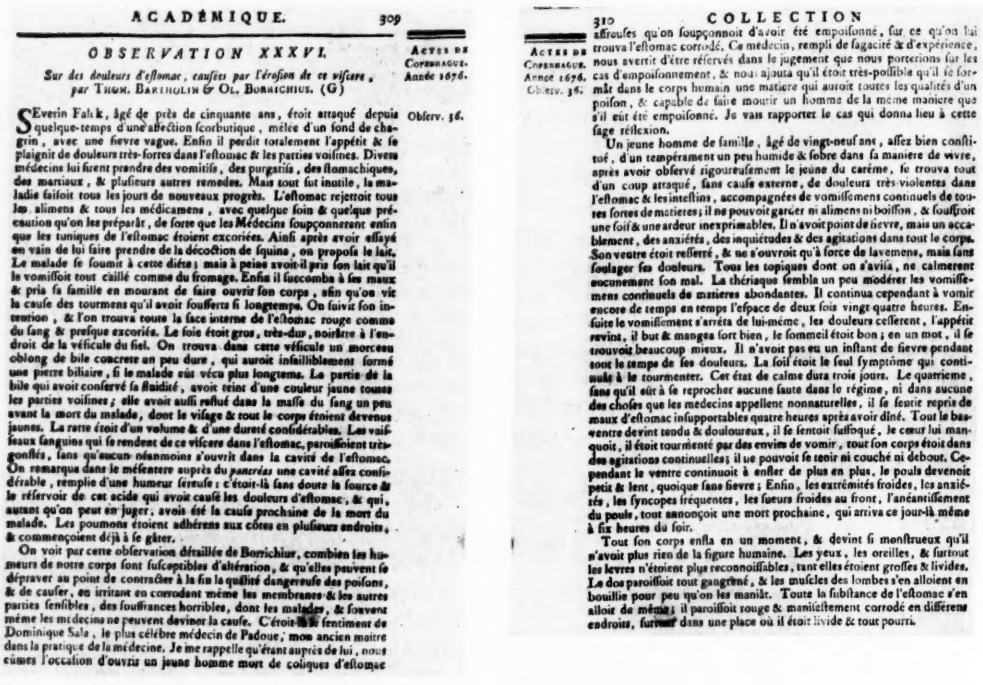
Paul Freher (1591-1681), in his "Theatrum virorum eruditione clarorum, 1688, Noribergæ, Johannis Hofmanni, describes the lives and the causes of death (in many instances) of the cardinals and bishops, including the famous Cardinal Baronius who died of uncontrollable nausea which arose from three ulcers in the mouth of the stomach (Partis I, Sectio II, pp. 64-65, 1688).

Caesar Baronius (Sorano) Cardinalis died from gastric ulcer ("obiit ex ulcere stomachi") in June, 1607, at the age of 68 years: "Cum in senectute lethalem contraxisset nauseam, adeo, ut insensibili alimenti portione sustentari videretur, septuagesimum tamen superfuit Annum, quo XII num Sacrae Historiae Librum ex voto complevit. . . . In cadavere dissecto Medici tria ulcera in ore ventriculi invenerunt, unde rebellis ejus nauseae sedatus fuit stupor."

Riverius reported gastric ulcers and mentioned a case in a goldsmith of Montpellier.

SEVENTEENTH CENTURY

Friedrich Hoffmann, of Halle, (1660-1742) demonstrated the origin of the "*atra bilis*" in the stomach and knew that the vomitus consisted chiefly of blood from the vessels of the gastric wall, these vessels, in his opinion, being opened up by the action of the acid juices.



ACADÉMIQUE. 309

OBSERVATION XXXVI.

Sur des douleurs d'eſtomac, cauſées par l'éroſion de ce viſcere, par THOM. BARTHOLIN & OL. BORRICHIUS. (G)

ACTES DE COPENHAGUE. Année 1676.

SEverin Falck, âgé de près de cinquante ans, étoit attaqué depuis quelque-temps d'une affection ſcorbutique, mêlée d'un fond de chagrin, avec une fievre vague. Enfin il perdit totalement l'appétit & ſe plaignit de douleurs très-fortes dans l'eſtomac & les parties voiſines. Divers médecins lui firent prendre des vomitifs, des purgatifs, des ſtomachiques, des martiaux, & pluſieurs autres remedes. Mais tout fut inutile, la maladie faiſoit tous les jours de nouveaux progrès. L'eſtomac rejettoit tous les alimens & tous les médicamens, avec quelque ſoin & quelque précaution qu'on les préparât, de ſorte que les Médecins ſoupçonnerent enfin que les tuniques de l'eſtomac étoient excoriées. Ainſi après avoir eſſayé en vain de lui faire prendre de la décoction de ſquine, on propoſa le lait. Le malade ſe ſoumit à cette diéte; mais à peine avoit-il pris ſon lait qu'il le vomiſſoit tout caillé comme du fromage. Enfin il ſuccomba à ſes maux & pria ſa famille en mourant de faire ouvrir ſon corps, afin qu'on vît la cauſe des tourmens qu'il avoit ſoufferts ſi longtemps. On ſuivit ſon intention, & l'on trouva toute la face interne de l'eſtomac rouge comme du ſang & preſque excoriée. Le foie étoit gros, très-dur, noirâtre à l'endroit de la véſicule du fiel. On trouva dans cette véſicule un morceau oblong de bile concrete un peu dure, qui auroit infailliblement formé une pierre biliaire, ſi le malade eût vécu plus longtems. La partie de la bile qui avoit conſervé ſa fluidité, avoit teint d'une couleur jaune toutes les parties voiſines; elle avoit auſſi reflué dans la maſſe du ſang un peu avant la mort du malade, dont le viſage & tout le corps étoient devenus jaunes. La ratte étoit d'un volume & d'une dureté conſidérables. Les vaiſſeaux ſanguins qui ſe rendent de ce viſcere dans l'eſtomac, paroiſſoient très-gonflés, ſans qu'aucun néanmoins s'ouvrît dans la cavité de l'eſtomac. On remarqua dans le méſentere auprès du *pancréas* une cavité aſſez conſidérable, remplie d'une humeur ſéreuſe: c'étoit-là ſans doute la ſource & le réſervoir de cet acide qui avoit cauſé les douleurs d'eſtomac, & qui, autant qu'on peut en juger, avoit été la cauſe prochaine de la mort du malade. Les poumons étoient adhérens aux côtes en pluſieurs endroits, & commençoient déjà à ſe gâter.

Obſerv. 36.

On voit par cette obſervation détaillée de Borrichius, combien les humeurs de notre corps ſont ſuſceptibles d'altération, & qu'elles peuvent ſe dépraver au point de contracter à la fin la qualité dangereuſe des poiſons, & de cauſer, en irritant en corrodant même les membranes & les autres parties ſenſibles, des ſouffrances horribles, dont les malades, & ſouvent même les médecins ne peuvent devinter la cauſe. C'étoit-là le ſentiment de Dominique Sala, le plus célebre médecin de Padoue, mon ancien maître dans la pratique de la médecine. Je me rappelle qu'étant auprès de lui, nous eûmes l'occaſion d'ouvrir un jeune homme mort de coliques d'eſtomac

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ACTES DE COPENHAGUE. Année 1676. Obſerv. 36.

affreuſes qu'on ſoupçonnoit d'avoir été empoiſonné, ſur ce qu'on lui trouva l'eſtomac corrodé. Ce médecin, rempli de ſagacité & d'expérience, nous avertit d'être réſervés dans le jugement que nous porterions ſur les cas d'empoiſonnement, & nous ajouta qu'il étoit très-poſſible qu'il ſe formât dans le corps humain une matiere qui auroit toutes les qualités d'un poiſon, & capable de faire mourir un homme de la même maniere que s'il eût été empoiſonné. Je vais rapporter le cas qui donna lieu à cette ſage réflexion.

Un jeune homme de famille, âgé de vingt-neuf ans, aſſez bien conſtitué, d'un tempérament un peu humide & ſobre dans ſa maniere de vivre, après avoir obſervé rigoureuſement le jeune du carême, ſe trouva tout d'un coup attaqué, ſans cauſe externe, de douleurs très violentes dans l'eſtomac & les inteſtins, accompagnées de vomiſſemens continuels de toutes ſortes de matieres; il ne pouvoit garder ni alimens ni boiſſon, & ſouffroit une ſoif & une ardeur inexprimables. Il n'avoit point de fievre, mais un accablement, des anxiétés, des inquiétudes & des agitations dans tout le corps. Son ventre étoit reſſerré, & ne s'ouvroit qu'à force de lavemens, mais ſans ſoulager ſes douleurs. Tous les topiques dont on s'aviſa, ne calmerent aucunement ſon mal. La thériaque ſembla un peu modérer les vomiſſemens continuels de matieres abondantes. Il continua cependant à vomir encore de temps en temps l'eſpace de deux fois vingt quatre heures. Enſuite le vomiſſement s'arrêta de lui-même, les douleurs ceſſerent, l'appétit revint, il but & mangea fort bien, le ſommeil étoit bon; en un mot, il ſe trouvoit beaucoup mieux. Il n'avoit pas eu un inſtant de fievre pendant tout le temps de ſes douleurs. La ſoif étoit le ſeul ſymptôme qui continuât à le tourmenter. Cet état de calme dura trois jours. Le quatrieme, ſans qu'il eût à ſe reprocher aucune faute dans le régime, ni dans aucune des choſes que les médecins appellent nonnaturelles, il ſe ſentit repris de maux d'eſtomac inſupportables quatre heures après avoir dîné. Tout le bas-ventre devint tendu & douloureux, il ſe ſentoit ſuffoqué, le cœur lui manquoit, il étoit tourmenté par des envies de vomir, tout ſon corps étoit dans des agitations continuelles; il ne pouvoit ſe tenir ni couché ni debout. Cependant le ventre continuoit à enfler de plus en plus, le pouls devenoit petit & lent, quoique ſans fievre; Enfin, les extrémités froides, les anxiétés, les ſyncopes fréquentes, les ſueurs froides au front, l'anéantiſſement du pouls, tout annonçoit une mort prochaine, qui arriva ce jour-là même à ſix heures du ſoir.

Tout ſon corps enfla en un moment, & devint ſi monſtrueux qu'il n'avoit plus rien de la figure humaine. Les yeux, les oreilles, & ſurtout les levres n'étoient plus reconnoiſſables, tant elles étoient groſſes & livides. Le dos paroiſſoit tout gangrêné, & les muſcles des lombes s'en alloient en bouillie pour peu qu'on les maniât. Toute la ſubſtance de l'eſtomac s'en alloit de même; il paroiſſoit rouge & manifeſtement corrodé en différens endroits, ſurtout dans une place où il étoit livide & tout pourri.

Bartholin & Borrichius' report (1676)

Case of Henriette-Anne. According to Hurst, an old diary of Sir John Finch (1626-1682) gives an account of the very strange death in 1670 of "Madame Henriette-Anne d'Angleterre," daughter of Charles I, with necropsy findings. Littré quotes an account of this autopsy. *A perforation was found in the middle and anterior part of the stomach,* and although the peritoneal cavity contained a large amount of fluid and gas, and although this fluid was described as being oily, "grasse comme l'huile," it was not recognized that the perforation had occurred during life. From the clinical description of the case there is no doubt that perforation of an ulcer occurred before death and that the oil in the contents of the peritoneal cavity was *the castor oil* which the patient had swallowed as a remedy.

In the New York City Public Library, the writer read the story by É. Littré: "Henriette D'Angleterre Belle-Sœur De Louis XIV, Est-Elle Morte Empoisonnée?" in *La Philosophie Positive Revue,* by É. Littré and G. Wyrouboff, Tome Premier (I), pp. 183-211, July-Dec., 1867, *Paris,* Librairie Germer Baillière.

Littré (1801-1881), in his *Médecine et Médecins* (1872), pointed out that Madame's symptoms were typical of *a perforated gastric ulcer* and that poison could not have caused them without producing a very acute gastritis which was not evident after death.

In the Bibliothéque Nationale, Paris, there is preserved the *Memoir of a Surgeon of the King of England, who was present at the opening of the body of "Madame."* This report stated: "The outside of the stomach looked healthy, and the inside was free from disease, except for a little hole in the middle of the anterior wall, which had been acci-

dentally produced by the surgeon with the point of his scissors. Close examination of the rest of the stomach showed no excoriation, corrosion, hardness, discoloration or lesion."

Archibald Malloch also knew of this graphic description of the symptoms produced by the perforation of a gastric ulcer as described by Madame de la Fayette, lady-in-waiting to Henrietta Anne, Duchess of Orleans and daughter of Charles I, who was with her royal mistress on June 29, 1670, at Saint-Cloud during the last hours of her life. The Duchess had suffered for some time from pain in the stomach and side, but otherwise she seemed to be in good health. One day after dinner she complained several times of pain, and drank some chicory water as a stomachic. "Putting the cup down with one hand, with the other she pressed her side, and said in a voice which betokened much suffering: 'Ah! what a stitch in the side! Ah! What pain! I can bear no more.' Speaking these words she flushed, and, a moment afterwards, turned pale and with a wan lividity which astonished us all. She kept crying out, and begged to be carried away, for she could no longer hold up."

Other Cases. Bonetus, of Geneva, in his *Sepulchretum sive Anatomia Practica* (Geneva, 1679, Leonard Chouët; Cramer & Perachon, 1700) quotes the history, told by John Bauhin, of a doctor's wife, 18 years old, who had passed blood in her stools, and who died on the fourth day of an attack of peritonitis, which was shown at postmortem examination to be due to *the perforation of a gastric ulcer.*

The report of Courtial, of Toulouse, "sur un trou trouve au ventricule d'une personne de la mesme ville," appeared in Journal Des Scavans, Tome Seizieme, 554-556, Oct. 25, 1688, Amsterdam, Wolfgang, Waesberge et al., 1689. "... Quand on ouvrit le corps, et que l'on visita le ventricule, on trouva vers la partie superieure, moyenne, et anterieure, un trou de figure ovale, long d'un pouce et demi, dont la circonference estoit bordee d'un corps calleux, qui ne ressembloit pas mal à un galon qui borderoit les deux cotez d'une étofe."

V entris Tumor flatulentus & aquosus, à ventriculo post inflammationem perforato.

D. Salvatoris Medici uxor 18. annorum, cui numquam menstrua defluxerant, quæ multis mensibus antea laborarat quartana, splenemque magnum habebat, illi venter nonnihil intumescebat, licet nulla de re conquereretur. Ira ut dubium esset an prægnans. die 25. Octob. incidit in dolorem ingentem scapulæ lateris sinistri, vix poterat corpus movere, febricitabat, conquerebatur de hypochondriorum dolore, maxime de sinistro, vomituriebat, & ructus emittebat, venter admodum intumuit, & subito difficulter spirabat, dentibus interdum stridebat, dolebant lumbi, potum appetebat quem raro reiiciebat: Vires statim prostratæ, 29. mane, circa 2. aut 3. obiit, semper mente constans.

Ex aperto ventre ingens copia flatus erupit, fœtidi admodum, inter intestina & peritonæum multus humor aderat, circa latus sinistrum apparuit pinguedo innatans, quæ suspicionem præbuit esse velex enematis vel ex jusculis. Rem inquisivimus, invenimus foramen circa medium ventriculi partem, ad fundum, ubi jungitur epiploon cum ventriculo prope Colon, versus sinistrum latus, magnitudinis digiti. Epiploon, ventriculi tunica tertia, hepatis tunica, & ligamentum suspendens, omnia erant putrida: ventriculus adhuc bene habebat: Intus continebantur multa nigra, antea ita ut videretur humor melancholicus: Pridie supremi diei sanguinem concretum longitudine dodrantali exreverat per anum cum grumum nullum, Splen detumuerat.

Theophile Bonetus, 1679; 1700, *Sepulchretum.*

Muralt, in his *Curationes* (or Exércitationes?) *medicae observationibus & experimentis anatomicis mixtae* . . . Amsterdam, 1688, reports a case of perforations of the duodenum occurring in a soldier. I believe there is a copy of this book in the Bibliothéque Nationale (Paris), a volume of 593 pages. Dr. Meyer-Ahrens published an article entitled "Die Arztfamilie von Muralt," in the *Schweizerische zeitschrift für Heilkunde,* Bern, 1861-1863, vol. 1, pp. 268-289, 423-436, and vol. 2, pp. 25-47. This contains an account of the *Exércitations* (see vol. 1, p. 281), according to a personal communication from Dr. Archibald Malloch, of New York.

Panthot's report appears in the *Journal Des Scavans,* 1695 (Aug. 1), Tome XXIII, ed. 2, Revue & Augmentée, Amsterdam, Janssons à Waesberge, 1709. Mr. de Rhodes, Vice-Doyen du College de Lion, the patient, was a man of delicate constitution and was subject to migraine, vomiting and colic. "On decouvrit ensuite que la membrane veloutee estoit toute consumée et *ulcerée* en plusieurs endroits, mais que le mal principal estoit au Pilore, qui estoit dur, épais, et

OBSERVATIO XL.

Dn. D. SAMUELIS GRASSII.

De perforato Ventriculo Hydropis Aſcitis cauſa.

VIrgo quædam, triginta circiter annorum, obeſioris paululùm habitûs, floridæque faciei, cùm nimiâ conſtrictione thoracis & hypochondriorum juncam ſe reddere intenderet, negleclâque ſimul diætâ, menſium paſſeretur obſtructionem, tandem in plenariam incidit cachexiam. Jàm intumeſcentibus pedibus, tandem & in majorem molem ſe extulit abdomen, non ſine ſuſpicione læſæ pudicitiæ. Præter conſuetaſymptomata, quæ comitantur hydropem, conquerebatur de inſigni dolore ſiniſtri hypochondrii & abdominis, quotiescunq; aliquid vel juſculi, vel cereviſiæ, frigidioris imprimis, vel medicamentorum etiam aſſumſerat. Varia hìc à Medicis & Medicaſtris per longum tempus tentata fuere remedia, irrito ſemper ſucceſſu. Tandem vocatus & ego, ſedulò in id incubui, quò in cavitate abdominis undulantem faburram tàm per veſicam, quàm alvum evacuarem, aſt vel fortiſſimis purgantibus, vix 4. ſedes provocare potui, indies altius ſurgente abdomine. Tandem lapſis viribus beatè expiravit. Conſulturus famæ pudicæ virginis, ſuadeo ſectionem, quam ægrè ab amicis obtinui. Cumque abdomen aperirem, ſtatim effluxit juſculum cereviſiæ albæ, cum micis panis ſimilaginei, quod heri comederat, hoc cochleare exceptum idem erat, quod reperiebatur póſt in ventriculo. Largiore inflicto vulnere, ultra 40. efflu-xere menſuræ fœtendis aquæ, Omentum putridum, propter copiam aquarum verſus diaphragma protruſum reperiebatur; Ventriculus, verſus Lienis regionem, ad articuli digiti longitudinem perforatus, veſicaque minima eaque vacua tàm ſtrictè utero adnata erat, ut vix ſine cathetere inveniri potuerit, cætera viſcera ſana erant. Patet exinde cauſa tùm doloris poſt aſſumpta quævis, tùm quoque ipſius hydropis. Unde verò perforatio hæc ortum ſuum duxerit, hariolari impoſſibile fuit, cùm nullum præcedentis inflammationis & ſubſequentis ulceris veſtigium deprehendere licuerit, labiis vulneris exiſtentibus puris, nec calloſis. Cumque foramen in medio quaſi ventriculo fuerit, ſimulque liene obtectum, oppidò liquet, ægram miſeram ſuam vi-

Samuel Grassius (1695). *Miscellanea Curiosa sive Ephemerium German. Academiae C.-X. naturae Curios.* Decuriae III, Annus III, Annorum 1695 & 1696, Ed. 1696, Lipsiae, Fritschium Observatia XL, pp. 44-46.

tellement schirreux et bouché, que l'ouverture qui lui restoit n'estoit pas capable de recevoir une mediocre épingle. Le mal se répandoit jusqu'au Duodenum, au fond de l'estomac et a'l'omentum."

In passing, mention might also be made of *"De oxyregima"*, by J. C. Kletwich, Francofurti ad Oderam, 1689, in which are discussed normal and disordered gastric secretions.

Morgagni. Giovanni Battista Morgagni (1682-1771) believed that the gastric lesion (ulcer) was of the nature of gangrene of the stomach and agreed rather closely with Hippocrates (460-370 B. C.) as to the peculiar nature of the *"atra bilis."* Hippocrates described the character of the vomitus and stools and named the condition *"morbus niger."* He recommended dietary treatment for ulcer of the stomach, although he had no definite idea of this particular lesion.

Ex inflammatione inteſtina livebant : nec male olebant tamen, ut nec ventriculus, quem ad me attulit is qui cadaver ſecuit, & cætera quæ hactenus ſcripta ſunt, diligenter narravit, Mediavia noſter. Cauſa afferendi fuit, ut dubitationem quandam ipſi eximerem poſtquam ventriculum perluſtraſſem. Erat hic contractus, facie interiore paſſim hic illic inflammatus, in ipſoque jugi medio habebat ulcus circuli ferme ambitu, cujus diameter aliquanto erat brevior tribus digitis tranſverſis, profunditate exigua, quippe cum crebræ in eo apparerent lenticulares glandulæ mediocri magnitudine, & adeo manifeſtæ, ut per oſculum quod in earum centro conſpiciebatur, ſetam immilerim. Labris tamen paulo craſſiuſculis ejuſmodi ulcus cingebatur : & craſſa erat facta, dura, & magis quam alibi, etiam illa ventriculi ſubſtantia toto eo ſpatio quod ulceri exterius reſpondebat. Cum autem eſſet in medio fere ulcere ventriculus penitus perforatus; ex me quærebat Mediavia, num cenſerem,

Giovanni Batista Morgagni, *De Sedibus*, 1761.

Morgagni in 1737 found an ulcer in the duodenum as well as several in the stomach of a woman who died 24 hours after the onset of severe abdominal pain. There is no definite evidence that the ulcers had perforated.

Every surgeon and gastroenterologist should be interested in the case reports in Morgagni's "De Sedibus" ["De Morbis Ventris," Liber III, Tomus Secundus, Letter XXIX, Articles 14-22, pp. 16-19 of the Latin Edition, Venice, 1761; and pages 33-42, Vol. II of the English Edition, London, 1769, "Of the Seats and Causes of Diseases Investigated By Anatomy"]. In Article 14, page 16, Liber III, 1761, Morgagni reports the case of an old woman who died from a *perforated gastric ulcer* the middle of October, 1735.

Of interest, too, is Morgagni's reference to Tyson's case *in an American with gastric perforation* (Book III,

Letter XXIX, Article 16, of *"De Sedibus"*).

EIGHTEENTH CENTURY

Alexis Littre, in 1704, reported a case in which death followed hematemesis from a gastric ulcer.

XVII.

Un homme de 26 ans étant mort aprés avoir eu durant 3 ſemaines une douleur continuelle d'eſtomac, des maux de cœur frequens & des nauſées, & avoir rendu les derniers jours de ſa vie beaucoup de ſang par haut & par bas, fut ouvert par M. Littre, qui lui trouva dans l'Eſtomac un ulcere rond, de 5 lignes de diametre, & de demi-ligne de profondeur, ſitué à un pouce & demi du Pilore, & 3 chopines de ſang dont une partie étoit caillée & l'autre liquide épanchées dans la cavité de l'Eſtomac, les Inteſtins à moitié remplis de ſang, les Ventricules, les Oreillettes, & les Vaiſſeaux du cœur, auſſi-bien que les autres gros vaiſſeaux du reſte du corps entierement vuides de ſang, & pleins d'air, & peu de ſang dans les vaiſſeaux moyens & dans les petits. Il eſt aſſés clair que l'ulcere de l'Eſtomac a été la cauſe de ce grand épanchement de ſang, auſſi y voyoit-on fort ſenſiblement pluſieurs vaiſſeaux ſanguins ouverts, mais pour la cauſe de l'ulcere, on ſoupçonna que ce pouvoient être des medicamens violents que le Malade avoit pris d'un homme peu experimenté.

M. Littre dit que dans ceux qui ſont morts d'une perte de ſang, de quelque nature qu'elle ait été, il a toûjours trouvé pleins d'air les vaiſſeaux qui étoient vuides de ſang. Apparemment par la reſpiration continuelle le corps ſe penetre & s'imbibe entierement d'air, qui entre dans tous les pores des membranes & des tuniques des vaiſſeaux, où il eſt ſans ceſſe comprime par le cours rapide du ſang, & d'où il ne ſort que quand ces vaiſſeaux etant vuides, il a la liberté de ſe dilater. Alors il prend une grande extenſion, & les remplit.

Left and above, Alexis Littre's case (1704).

Albertus von Haller (October 8, 1708—Dec. 12, 1777), in his *Opuscula Pathologica,* [Latin Edition, Lausannae, 1755, Observation 21, pp. 44-45; Observation 23, pp. 47-48; and in the English Edition, London, 1756, Observation 21, pp. 44-46, and Observation 23, pp. 48-49] reports two interesting cases: Obs. 21, "Obesitas Male Curata;" and Obs. 23, "Ulcus Coli in ventriculum patens."

Maximilian Preuss (1715), in his report above mentioned, speaks of

"De ventriculi perforati, hepatisque per hocce foramen illius cavitatem ex parte subintrantis illudque claudentis, cum eoque connexione cartilagineo membranacea firmiter concreti ac connati quasi, aliorumque in corpore muliebri, constitutione summe praeternaturali." He continues as follows: "Illa nempe Regina Catherina nomine, anno aetatis circiter quarto decimo aut paulo ante, priusquam prima menstrua erumperent, dolore quodam anxiosa circa sinistrum hypochondrium scrobiculum: . . . de doloribus circa lumbos, subluxationem comitari consuetis, ac molestissimum quendam circa ventriculi regionem sensum cum inanibus vomendi conatibus querebatur . . . nec non artus intumescere incipiebant, donec summe & ad rupturae ferme metum tenso abdomine, postremis diebus, multis faecibus nicricantibus excretis, quartus Martii des aelatis anno 44-, diu exoptatam Analysin afferet . . . Ventriculus ipse multo sanguine congrummato repletus. Fundus ventriculi per totam longitudinem ad pylorum usque, scirrhoso glandulosa excrescentia inaequali, & hinc inde plus quam transversi digiti latitudine protuberante, obsessus, ipse que ventriculus in duos quasi saccos diremptus. Hepar, lien, renes, uterus naturalia & integra . . ."

J. G. Volcamerus reported a case of "De Foramine Ventriculi" (Observation No. 229, in Miscel. Curiosa — Nat. Curios., sive Ephemeridium — Decur. I, Ann. II, Editio Tertia, Klosium, Francofurti & Lipsiæ, 1725): ". . . per œsophagum, pauló supra superius ventriculi orificium, ruptum, liquorem illum nigricantem in ventriculum congessit, unde per intervalla vomitu ista saburra prodiit."

Christopher Rawlinson, in 1729, reported a case of *perforated gastric ulcer* under the title, "Of a preternatural Perforation in the Upper Part of the Stomach" [Philosophical Trans. Roy. Soc., London, 35: No. 400, p. 361, 1727-1728; Abridged Vol. VII, 1724-1734, pp. 212-213, 1809, London].

James Skidmore had complained for three or four years of a violent pain in his stomach and bowels, never being able to rest in his bed at night, until he had vomited up the greatest part of what he had eaten or had drunk the day before. At necropsy, the stomach was found perforated in its upper part, about the middle

space between the two orifices, wide enough to contain the end of one's finger . . . That part of the stomach next the pylorus was above four times thicker than in a natural state. . . . It was firmly tied down to the pancreas.

application of snow to the surface of the abdomen.

The celebrated Plancus, in his *Epistola, De Monstris ac Monstrosis* (Jani

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VIII. *A preternatural Perforation found in the upper Part of the* Stomach, *with the* Symptoms *it produc'd, by Mr.* Chriſtopher Rawlinſon, *Surgeon.*

JAMES *Skidmore* had complain'd for Three or Four Years laſt paſt, of a violent Pain in his Stomach and Bowels, never being able to reſt in his Bed at Night, 'till he had vomited up the greateſt Part of what he had eat or drank the Day before. He would often compare his Pain to ſome great Weight laying upon the Region of the Stomach, which he in ſome Meaſure alleviated, by preſſing hard with his Hand upon that Part. When he turn'd himſelf in Bed from one Side to the other, he told me, he could plainly perceive that ſome Fluid or other fell down with Noiſe to the depending Side; which Fluid he believ'd to be the Occaſion of all his Miſery: For which Reaſon he often ſaid, he would willingly conſent, nay, often earneſtly preſs'd that the Surgeons would cut him open (as he expreſſed it) and let it out.

He had no apparent *Tumour* upon the Part, nor was his Belly more *extended* than uſual. He had had the Advice of ſeveral able Phyſicians before he came into the Hoſpital, but all without the leaſt Amendment to his Diſeaſe. When he died we were deſired to open him, and try if we could find out the Cauſe of his Complaints. As ſoon as we had penetrated the *Peritonæum*, there flow'd out a whitiſh Liquor, not much unlike to *Whey*, only a little more thick and fæculent;

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nor did it emit ſo noiſom a Smell as might be expected from its long Reſidence in that Place. We computed there were above Four Quarts of this Liquor contain'd in the *Cavity* of the *Abdomen*.

When we came at the *Stomach* we found it *perforated* in its *upper* Part, about the middle Space betwixt the Two Orifices, wide enough to contain the End of one's Finger. We cut it open Length-ways, and found it pretty full of a thick glutinous Matter, inclining to be yellow; and to its inner Coat, on the lower Side, there firmly adher'd the Stone of a *Prune*, or ſome other Fruit reſembling it. On its Inſide, near the preternatural Perforation, 'twas gangreen'd for two or three Inches; and on the other Side of the Perforation there was an *Ulcer* near the ſame Bigneſs. The whole Stomach was a great deal thicker than uſual; but that Part next the *Pylorus* was above Four Times thicker than in a natural State. It *adher'd* cloſely to all the Parts about it; and to the *Pancreas* 'twas ſo firmly ty'd down, that it could not be ſeparated without tearing. The Spleen did not exceed a Quarter of an Ounce in Weight. The *Pancreas* was *ſchirrous*, tho' pretty near its natural Size. In the *Liver* and *Kidneys* there was no apparent Defect; nor had the Parts in the *Thorax* receiv'd any viſible Alteration, except that the *Lungs* adher'd more firmly to the *Pleura* than uſual. The *Inteſtines* and all the *Viſcera* contain'd in the *Abdomen* were of a whiter Colour than uſual, by being ſo long ſodden in the Liquor they floated in.

IX. *An*

Christopher Rawlinson's case (1727).

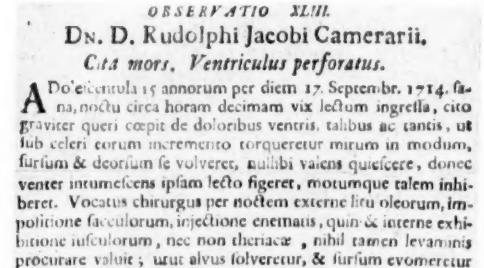
Interesting comments are found under the title of "Ventriculus," pp. 1313-1318, 1739 (Noribergæ), XXVII, in "Synopsis observationum medicarum et physicarum Ephemeridum Acad. naturae curiosorum."

Malloch (1919) erroneously states that the term "Ulcus ventriculi" was first employed by Johann Peter Frank (1745-1821); he advised a milk diet, absolute rest "summa quies corporis imperanda," the internal use of serum lactis albuminatum as a styptic; and

Planci, Venetiis, 1749), reports a case of *pyloric ulcer* and speaks of "Conspectus Segmenti Ventriculi, in cuius fundu versus Pylorum Ulcus callosum, et profundum conspiciebatur" (Tab. II, Fig. I, page 30); and "Ulcus hoc callosum Ventriculo hic memoro, quod hoc morbi genus saepenumero a me observatum sit Armini," etc. (page 16, lines 20-21; page 17, lines 5-16).

Other reports of this period of interest are those by J. H. Furstenau, ["Foramen in fundo ventriculi," *Acta*

Physico-Medica Academiae naturae curiosorum, IX, Obs. V, pp. 16-17, 1752, Norimbergæ]; Maximiliani Preussii ["Ventriculi perforati," *Academiae Naturae curiosorum Ephemerides,* Centu-



OBSERVATIO XLIII.

DN. D. Rudolphi Jacobi Camerarii.

Cita mors. Ventriculus perforatus.

A Do'escentula 15 annorum per diem 17. Septembr. 1714. fana, noctu circa horam decimam vix lectum ingressa, cito graviter queri cœpit de doloribus ventris, talibus ac tantis, ut sub celeri eorum incremento torqueretur mirum in modum, sursum & deorsum se volveret, nullibi valens quiescere, donec venter intumescens ipsam lecto figeret, motumque talem inhiberet. Vocatus chirurgus per noctem externe litu oleorum, impositione faculorum, injectione enematis, quin & interne exhibitione iusculorum, nec non theriacæ, nihil tamen levaminis procurare valuit; utut alvus solveretur, & sursum evomeretur phlegma, sed illud sine ulteriore perturbatione alvi aut fluxu, & hoc parce, ut mane quasi amplius absolvi non posse videretur; neutrubi autem excernerentur cruenta. Enimvero tam cito inflabatur venter adeo, tympanitice tensus, insolito modo, ut ad reddendum enema staret erecta, sedere non potuerit, nec porro in lecto erigi, præ tumore ventris duri, qui ad tactum valde tumebat, nec lectum quidem incumbentem facile ferebat, & invalescens ad medium, quin collum, usque loqui concedebat non nisi ægre. Inter lamenta de recursu dolorum frequenti constabat mens, precibus Deo devota, nec observabantur deliquia; hinc nec deliria intervenerunt, nec eruperunt convulsiones; sed puella sic afflicta inter horam 7. & 8. diei 18. Septembr. cum potum modo petiisset, facie livescens, ad latus conversa, vomiturire visa, subito exspiravit.

Fati hujus causa est occulta. Quod dispositionem personæ & occasionem externam concernit, huc redit, quantum constat. Sana quidem fuerat ipsa, sed tenera, pallidula, gracilis, non parvula tamen, domi sub laboribus levioribus non gravibus rusticis educata, ventris plerumque a cibis duriusculis concoctu difficilioribus murmurantis, nondum menstruata, (cum mater tamen in decimo tertio quondam anno jam fuerit) tertia in ordine filiolarum, quas præmature abreptas lugent parentes. Per diem quidquam passa non fuit, errores diætæ manifestos non commisit; ipsam neque tunc, cum recens historia, neque ex post facto, malignum quid domi vel foris assumsisse innotuit, præterquam hoc unicum, suspectum, dubium, vix suffecisse creditum: Emerat mane cum sorore, natu minore, pruna damascena recentia, pro sua parte circiter octodecim, successive per diem comesta, reservarat tamen, ut creditur, pauca ad noctem, antequam

R. J. Camerarius (1717), *Academiae C.-L.C. naturae curiosorum Ephemerides sive Observationum medico-physicarum Centuria V et VI,* Noribergae Wolfganger Michahelles, anno 1717, observatio 43, pp. 62-65. (Sept. 17, 1714).

ria III et IV, Observatio XIII, pp. 26-29, 1715, Noribergæ]; Geoffroy ["Observation sur une ouverture a'l'estomac," *Histoire de la Soc. Roy. de Médecine,* 1780-81, IV: 262-263, 1785, Paris].

Sir G. Baker, in 1772, referred to a case of *duodenal ulcer* in a gentleman who was treated for "atra bilis." After death the "atra bilis" was found to be blood from an ulcer at the beginning of the duodenum.

James Carmichael Smyth (March 2, 1790) reported a case of a young lady, 15 years of age, whose sudden death was occasioned by an *ulcer in the stomach* [Medical Communications, London, II: 467-471, 1790, Joseph Johnson].

NINETEENTH CENTURY

Rayer (Hospital De La Charité) reports a case of *perforation of the duodenum (Gazette des Hôpitaux* I: 137-138, Mar. 21, 1839) and, what is of especial historical interest, in this article makes reference to Penada's report of the case of Domenico Miazzo who died of perforating ulcer of the duodenum after much suffering. This reference by Rayer was not known to Sir Arthur F. Hurst, of London, and Dr. Archibald Malloch, of New York, when they published reports of Penada's very interesting and accurately described case of perforating ulcer of the duodenum (Padova, 1793). Rayer also refers to J. Muralto ("Curationes medicæ, observationibus, etc.," Amsterdam, 1688): "Muralto a trouvé, dans le cadavre d'un soldat, le duodenum perforé en deux endroits."

Jacopo Penada (born in Padua, Dec. 11, 1748; died Feb. 23, 1828) published an account *of a perforating ulcer of the duodenum* in his book "Saggio / D'Osservazioni, E. memorie / sopra Alcuni Casi Singolari / Riscontrati nell' Esercizio della Medicina, / e della Anatomia Pratica / dal dottor / Jacopo Penada M. F. / Socio Corrispondente della Reale / Accademia delle Scienze, / Lettere, ed Arti / Di Padova ec. ec. / In Padova MDCCXCIII / Per Approvazione." I believe Dr. Charles Singer (Kilmarth, Par, Cornwall, England) owns a copy of Penada's book. This quarto volume of 146 pages contains nine chapters or "osservazioni," of which the third one,

Illustration from one of the earliest reports of perforation of the duodenum. Case of Domenico Miazzo reported by Jacopo Penada (1748-1828), Padova, 1793.

pages 33-56, concerns this interesting case.

Archibald Malloch (of The New York Academy of Medicine) published (1919) "An Early Record of Perforating Duodenal Ulcer," which was the case report of Jacopo Penada's patient, Domenico Miazzo, of Padova, who died June 23, 1791.

Matthew Baillie (1761-1823), physician to St. George's Hospital, gave an early clear description of the morbid anatomy and symptoms of *gastric ulcer* in 1793, in his "Morbid Anatomy of Some of the Most Important Parts of the Human Body." He wrote, "Opportunities occasionally offer themselves of observing ulcers of the stomach." He is credited with the first accurate anatomical description of stomach ulcer, in 1793, including the description of the shelving floor of the lesion, and he published accurate and clear plates.

Credit should also be given to Cruveillhier (1791-1874) for his early description of *"ulcus simplex chronicum"* in his "Anatomie Pathologique." His treatment of the condition was, "Le repos c'est la diet."

However, gastric ulcer is frequently called *"ulcer of Cruveilhier"* in French literature, where it is also stated that Cruveilhier's investigations (1829-1835) established the anatomical characteristics and complications and the principal clinical features of gastric ulcer. He is thought by French writers to be the first definitely to distinguish chronic ulcer from cancer and to suggest a method of treatment. I believe that Abercrombie already recognized all this in addition to his description of duodenal ulcer, which Cruveilhier had failed to mention as late as 1856. Cruveilhier described, however, a case of perforation of a chronic ulcer of the duodenum and illustrated it with a drawing in his *Anatomie Pathologique.*

John Abercrombie (1780-1844), of Edinburgh, gave an excellent description of the symptoms of *gastric ulcer* in his *Pathological and Practical Researches on Diseases of the Stomach, the Intestinal Canal, the Liver, and Other Viscera of the Abdomen* (1828). He described the symptoms which occurred when an ulcer bled or perforated, and recommended special treatment. He recognized that cancer of the stomach was a distinct disease. He reported a case October 1, 1835, entitled, "Duodenal Perforation in a Lady Aged 30 Years."

Benjamin Travers, in 1816, described a number of cases of perforated gastric and duodenal ulcer under his care.

Perforated ulcers of the stomach were recorded by R. G. Gastellier (1815), C. G. Schmalz (1820-1822), L. F. Gasté (1822), J. B. Beck (1823), F. Praël (1825), G. Giaconi (1829), L. Rawlson (1830), Girard (1831), Ricord (1831), J. Sym (1835), Rokitansky (1840), Ward (1841), Phinney (1841), Graves

(1841), Crisp (1843), Parjzek (1843), Peste (1844), Marcus (1845), E. Young (1845), Peacock (1846), Lawrence (1846), Orelli (1846), Williams (1846), Russell (1848), Geyer (1849), Wartena (1849), Ekman (1850), Beyer (1853), and Lees (1856). Craigie (1835) reported three cases of ulcerative destruction of the coats of the stomach [Edinburgh Med. & S. J. 44: 262-277, 1835], in which "the ulcerated aperture was situate in the small arch of the stomach"; he read his report before the Edinburgh Medico-Chirurgical Society October 1, 1835.

Perforation of the duodenum in early medical literature has been recorded by many writers following the previously mentioned earliest reports by J. Muralt (1688) and J. Penada (1793). Among nineteenth century reports are those by A. Girard (1804), C. Hastings (1828-1829), Robert (1828), S. C. Wait (1841) and Lenepveu (1839). Lenepveu presented his report at the March, 1839, meeting of the Société Anatomique de Paris under the Presidence de M. *Cruveilhier,* as a spontaneous perforation of an old ulcer of the anterior surface of the duodenum. Others are Rayer (March 21, 1839), C. M. Gibert (April 27, 1852), Klinger (1861), Krauss (1865), C. Alloncle (1883) and Perry and Shaw (1894). F. Trier (1863, Copenhagen) speaks of *ulcus corrosivum duodeni.*

A case of ulceration of the duodenum with formation of a hepatico-diaphragmatic pouch, occurring in a patient aged 68 years, is reported by Drake, Rives and Gross (Western J. M. & Phys. Sc., Cincinnati, XI: 510-514, 1838). There was a perforation on the upper wall of the duodenum, one inch below the pylorus. The patient died May 13, 1837, 19 days after the excruciatingly painful epigastric attack and spasm. Professor Gross performed the necropsy. Professors Drake and Rives were the attending physicians.

In the case of Charles Hastings cited previously [Midland Medical and Surgical Reporter, Worcester, I: 292-293, No. 4 (May) 1829] the patient was a woman aged 30 years who died March 31, 1813. In the duodenum, beyond the part into which the biliary duct entered, an ulcer larger than a crown piece was found. The ulcer was a *cancerous* kind; its edges were very ragged and everted. The surface of the ulcer was very irregular from fungous excrescences. The coats of the intestine around the ulcerated part were much thickened.

W. Bainbridge in his report, "Cases of Perforation of the Stomach and Duodenum" [Lancet II: 56-59 (April 9) 1842], describes two cases of perforation of the stomach (woman, aged 60; girl, aged 18) and two cases of perforation of the duodenum. He refers to Hodgkin's observations that the *"valvular pylori" portion of the duodenum is peculiarly prone to disease, and often lacerable.*

The case of duodenal perforation reported by Joh. Heinr. Beck ["Fall von spontaner Perforation des Zwölffingerdarms, *Zeitschrift für die Staatsarzneikunde* (A. Henke, Erlangen), 15th *Ergänzungsheft* (Zum elften Jahrgange gehörend), pp. 60-86, 1831] was that of a miller, aged 35 years, six feet tall and of choleric temperament (Thaddäus H.).

Instances of perforation of the duodenum were reported by J. W. Ash [Med. Exam., Phila., 6: 169, Aug. 5, 1843]; J. G. Bailey ["Perforation of the Duodenum followed by Fatal Peritonitis in a Female the Day after Marriage," Med. Times, London, 15: 223, Dec. 19, 1846]; W. J. Little ["Case of Chronic Ulceration of the Duodenum and Perforation," Lancet, London II: 6, (July 5) 1845]; Lambert [Ulceration du duodénum. Occlusion du canal cholédoque à son embouchure," Gaz. d. hôp., Paris, 2: 2d Series, 379 (Aug. 13) 1840, "le chevalier de l'âge de cinquante ans, célibataire . . . "]; Alexandre Gerard [Observation d'une perforation spontanée de l'intestin duodénum," (Jour. Général De Médicine, De Chir., De Pharm., etc.

19: 379-386, 1804) the patient being a man, 55 years of age; and a report under the title, "Observation sur une perforation du duodénum," J. Univ. d. sc. méd. de Paris, 51: 255, 1828.

The fatal case reported by Ash (1843) was that of a patient 50 years old of strongly marked bilious temperament who was suddenly seized (June 15, 1843) with epigastric pain of the most intense severity. The necropsy was performed by William E. Haines, who found a perforation of a duodenal ulcer, circular, as though made by a shoemaker's punch, as large as a medium sized goose quill, about one and one-half inches below the pylorous.

Bailey's patient was a young woman, aged 28 years. The duodenum in its transverse portion was found to have a circular opening in it, surrounded by a black margin externally; internally, the perforation seemed larger, its side sloping off; there was evidence of previous inflammation around the ulceration. The sudden and fatal attack occurred immediately after the wedding, and the marriage was not consummated.

During the latter part of the nineteenth century several articles of importance made their appearance in medical literature, which should be mentioned in this historical review. Particularly deserving citation are the publications of J. Uffelmann ["Ueber die Methode der Untersuchung des Mageninhalts auf freie Saüren; Versuche an einem Gastrotomirten,"—*Deutsches Arch. f. klin. Med.,* Leipzig 26: 431-454, 1880]; G. Sticker ["Hypersecretion und Hyperacidität des Magensaftes," *München. Med. Wochens.* 33: 561-580, 1886]; W. A. Gluzinski and W. Jaworski ["On Disorders of Gastric Juice and Excess of Acidity," *Przegl. lek.,* Krakow 25: 605; 622, 1886]; A. Günzburg ["Eine neue Methode zum Nachweis freier Salzsaüre im Mageninhalt," *Centralbl. f. klin. Med.,* Leipzig 8: 737-740, 1887]; J. C. Blonk ["Zur Hypersecretion von Salzsaüre, *Berlin. klin. Wochens.* 24: 789-791, 1887]; J. Boas ["Ein neues Reagens für den Nachweis freier Salzsaüre in Mageninhalt," *Centralbl. f. klin. Med.,* Leipzig 9: 817-820, 1888]; G. Budd ["On the Organic Diseases and Functional Disorders of the Stomach," London, 1855]; W. Brinton ["Ulcer of the Stomach," London, 1857; and "Diseases of the Stomach," London, 1858]; and Bucquoy (*Arch. gèn. de Méd.* 1: 398-434, 526-553, 691-716, 1887, Paris).

C. A. M. Broussais discussed "Chronic Duodenitis" (Sur la Duodénite Chronique, Paris, 1823). The studies of Wilhelm Müller (1868, Jena) of postmortem examinations and the observations of T. B. Curling (1842), Swan (1823), Macfarlane (1833), Dupuytren (1832), Cooper (1839), Long (1840), Perry and Shaw (1893), Harkins (1938), Keeley (1939), Penner (1939) and others on duodenal ulceration following burns are interesting.

TWENTIETH CENTURY

One cannot leave this historical review without, at least, giving mention to those who have contributed so much to this branch of medicine during the early part of the twentieth century. Time and space will permit the writer only to cite such names as B. G. A. Moynihan, of Leeds ["On Duodenal Ulcer; with Notes of 52 Operations," Lancet I: No. 4250, 340-346, (Feb. 11), 1905, and numerous other publications]; W. Bruce Clarke, Surgeon of The St. Bartholomew's Hospital ["The Septic Origin of Gastric and Duodenal Ulcers," Lancet I: No. 4250, 346-347 (Feb. 11) 1905]; W. Hale White, of Guy's Hospital ["Are Not Some Patients Said to be Afflicted with Gastric Ulcer Really Suffering from a Different Disease?" Lancet I: No. 4061, 1819-1820 (June 29) 1901; and "Gastrostaxis, or Oozing of Blood from the Mucous Membrane of the Stomach," Lancet II: No. 4340, 1189-1195 (Nov. 3) 1906];Moynihan's paper on "Duo-

denal Ulcer and Its Surgical Treatment," [Lancet II: No. 4085, 1656-1663 (Dec. 14) 1901 and his Monograph on "Duodenal Ulcer," London, 1910]; the contributions of Sir Arthur F. Hurst (London); Knud Faber; Sippy; Rudolf Schindler (gastroscopy); Konjetzny; Francois Moutier (Paris); Haudek (1913, 1923); and the numerous valuable publications that have issued from the Mayo Clinic, the Lahey Clinic, the Hospital of the University of Pennsylvania (Philadelphia), Mount Sinai Hospital (New York), Guy's Hospital (London), Prof. Finsterer's Vienna Clinic, Max Thorek's Clinic (Chicago), and Professor Paolo Alessandrini's Clinic (Rome, Italy).

Contributions have also been made by Samuel and Soltau Fenwick (1893, 1900, 1902), Parry ("On Gastric Erosion," Guy's Hosp. Reports, 1868), Peter Ludwig Panum, ("Experimentelle Beitrage Zur Lehre von der Embolie," Virchow's Archiv., Vol. XXV, 1863-1864); Chvostek (1883); Oppenheimer (1891); Nothnagel (1904); Max Einhorn; Otto Hahn (1930, who reports two cases of perforated duodenal diverticulum, with recovery, and reviews the literature); and the recent publications by Bassler, F. K. Boland (July, 1939), La Due (1939), Finsterer (1939), Geisthövel (April 15, 1939), Kayne and Hounslow ("Examination of Gastric Contents for Tubercle Bacilli in Adults," June 10, 1939), Levin and Burton, et al. (July-August, 1939), Zadek (Freiburg, 1912), and Zemp ("Primary Jejunal Ulcer," July 1939).

ETIOLOGY AND DIAGNOSIS

The relation of the nervous system to gastric ulcer was a problem many years ago as it still is today. Thus Schiff, Brown-Sequard, Ebstein, Ewald, Cushing, and others have performed a number of experiments which tend to show that injury to certain parts of the brain, separation of the penduncles of the brain, of the optic thalami, of the corpus striatum, of the crura cerebri, of the anterior corpora quadrigemina, and also of certain portions of the spinal cord, can lead to hemorrhage, bloody infiltration, and ulceration of the stomach walls. Under certain conditions *gastric hemorrhage* may originate from lesions of the central nervous system. The experiments of Frerichs produced an ulcer of the stomach in a cat after division of the splanchnic nerves and of the coeliac axis. Ebstein, by injuries to the brain and cord in animals, produced ulcers upon a hemorrhagic base. He and Schiff remarked that injuries of the nervous system, brain and cord were attended with gastric ulcers, while Klebs accounted for some gastric ulcers through *spastic* contraction of the arteries. In view of some recent studies of a similar nature (Cushing, 1932; Masten and Bunts, 1934; and Vonderahe, May 1939) the above comments are of historical interest.

Bucquoy (1887) was able to make a correct diagnosis of five ulcer cases from the *symptoms* alone. John Abercrombie and Jean Cruveilhier correctly recognized duodenal ulcer a century ago. Latour, of Orleans, in 1815 observed the occurrence of fatal hemorrhage from the stomach without any evident lesion (Histoire Philosophique et médicale des hémorragies) and mentioned cases reported by Portal, Franck, Hoffman, van Swieten, Baldinger, and Warton; and Goldstein brought to the attention of the profession the unusual form of gastrostaxis due to *telangiectatic bleeding* (Goldstein's "Heredofamilial Angiomatosis," 1937, 1938).

MISCELLANEOUS LESIONS

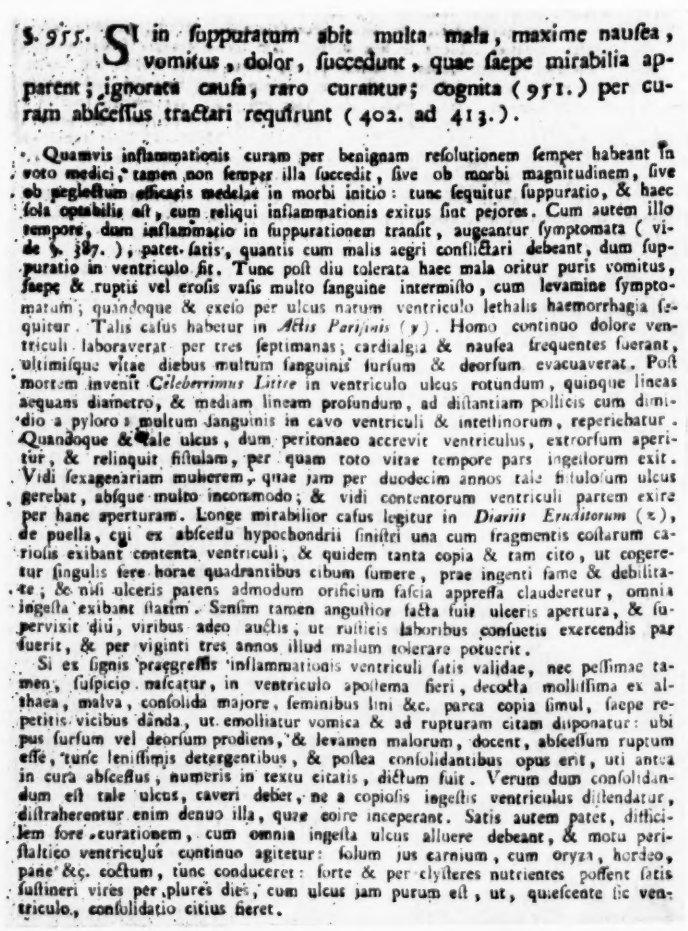
Healed gastric ulcers were noted by Forest, Schenk, Layard, de Haen, and Voigtel (Handbuch Der Path. Anat., Halle, II: p. 476, 1804), and others.

Ulcers in newborn infants were recorded by T. D. Lister, Spiegelberg, Goodhart, Siebold (1826), H. E. Thelander (Aug. 1939), J. Y. Simpson (1838, "Peritonitis in Foetus"), and

others. H. Adler (1907) deals with gastric ulcers in childhood, and J. Cathala (1938) reports on chronic duodenal ulcer in an infant.

The development of cancer on ulcer was recognized as occurring not infrequently by A. F. Holtzhausen (1832), Peacock (1848), Platow (1877), Dieumann, and others. Barling (1901), Hirschfeld (1902), and others did not share this view.

Gastric fistula. While it is true that Corvisart and Leroux (1802), and Beaumont were the first carefully to study digestion and movements of the stomach *in situ* (1825, 1826, 1833), many



§. 955. Si in ſuppuratum abit multa mala, maxime nauſea, vomitus, dolor, ſuccedunt, quae ſaepe mirabilia apparent; ignorata cauſa, raro curantur; cognita (951.) per curam abſceſſus tractari requirunt (402. ad 413.).

Quamvis inflammationis curam per benignam reſolutionem ſemper habeant in voto medici, tamen non ſemper illa ſuccedit, ſive ob morbi magnitudinem, ſive ob negleſtum efficacis medelae in morbi initio: tunc ſequitur ſuppuratio, & haec ſola optabilis eſt, cum reliqui inflammationis exitus ſint pejores. Cum autem illo tempore, dum inflammatio in ſuppurationem tranſit, augeantur ſymptomata (vide §. 387.), patet ſatis, quantis cum malis aegri conflictari debeant, dum ſuppuratio in ventriculo fit. Tunc poſt diu tolerata haec mala oritur puris vomitus, ſaepe & ruptis vel eroſis vaſis multo ſanguine intermiſto, cum levamine ſymptomatum; quandoque & exeſo per ulcus natum ventriculo lethalis haemorrhagia ſequitur. Talis caſus habetur in *Actis Pariſiis* (y). Homo continuo dolore ventriculi laboraverat per tres ſeptimanas; cardialgia & nauſea frequentes fuerant, ultimiſque vitae diebus multum ſanguinis ſurſum & deorſum evacuaverat. Poſt mortem invenit *Celeberrimus Littre* in ventriculo ulcus rotundum, quinque lineas aequans diametro, & mediam lineam profundum, ad diſtantiam pollicis cum dimidio a pyloro; multum ſanguinis in cavo ventriculi & inteſtinorum, reperiebatur. Quandoque & tale ulcus, dum peritonaeo accrevit ventriculus, extrorſum aperitur, & relinquit fiſtulam, per quam toto vitae tempore pars ingeſtorum exit. Vidi ſexagenariam muherem, quae jam per duodecim annos tale fiſtuloſum ulcus gerebat, abſque multo incommodo; & vidi contentorum ventriculi partem exire per hanc aperturam. Longe mirabilior caſus legitur in *Diariis Eruditorum* (z), de puella, cui ex abſceſſu hypochondrii ſiniſtri una cum fragmentis coſtarum cariofis exibant contenta ventriculi, & quidem tanta copia & tam cito, ut cogeretur ſingulis fere horae quadrantibus cibum ſumere, prae ingenti fame & debilitate; & niſi ulceris patens admodum orificium faſcia appreſſa clauderetur, omnia ingeſta exibant ſtatim. Senſim tamen anguſtior facta fuit ulceris apertura, & ſupervixit diu, viribus adeo auctis, ut ruſticis laboribus conſuetis exercendis par fuerit, & per viginti tres annos illud malum tolerare potuerit.

Si ex ſignis praegreſſis inflammationis ventriculi ſatis validae, nec peſſimae tamen, ſuſpicio naſcatur, in ventriculo apoſtema fieri, decocta molliſſima ex althaea, malva, conſolida majore, ſeminibus lini &c. parca copia ſimul, ſaepe repetitis vicibus danda, ut emolliatur vomica & ad rupturam citam diſponatur: ubi pus ſurſum vel deorſum prodiens, & levamen malorum, docent, abſceſſum ruptum eſſe, tunc leniſſimis detergentibus, & poſtea conſolidantibus opus erit, uti antea in cura abſceſſus, numeris in textu citatis, dictum fuit. Verum dum conſolidandum eſt tale ulcus, caveri debet, ne a copioſis ingeſtis ventriculus diſtendatur, diſtraherentur enim denuo illa, quae coire inceperant. Satis autem patet, difficilem fore curationem, cum omnia ingeſta ulcus alluere debeant, & motu periſtaltico ventriculus continuo agitetur: ſolum jus carnium, cum oryza, hordeo, pane &c. coctum, tunc conduceret: forte & per clyſteres nutrientes poſſent ſatis ſuſtineri vires per plures dies, cum ulcus jam purum eſt, ut, quieſcente ſic ventriculo, conſolidatio citius fieret.

"Ventriculi Inflammatio" in *Commentaria in Hermanni Boerhaave Aphorismos,* Neapoli, 1766, Tomus V: Section 955: pp. 132-133, by Baron Gerard van Sweiten (1700-1772).

lafoy (1897), Scott and Mider (April, 1938), Hauser (1883), Koch (1893), Letulle (1897), Fenwick (1902), Rokitansky and Dittrich, Lebert, Zenker, Rosenheim, Eichhorst, Ewald, Fritz Stromeyer (Freiburg, 1912), Eusterwriters have previously reported interesting cases of *gastric fistula*: M. C. Cornax (born circa 1520), Johannes Schenckius à Grafenberg (1530-1598) related two cases (1609), Petri Borell (1656); Christianus Mentzelius (1686),

du Verney (1704), Petit (1710), Michel Ethmuller (1730), August Wencker 1735), van Swieten (August 1737), Christian Wencker (April 17, 1743), D. W. Nebel (1782), George Burrowes (1794), Godac, Atkinson, Circaus, Helm, Klein, Covillard, Lassus, Percy, Lorey (1808), J. J. Gomez (1821), Foubert (l'Hotel Dieu), Marcus (1825, Berlin), W. Hamilton (1831), P. Bernard (1835), Jenrich (1839, Berlin) and Amedée Lefèvre (1842). Charles Richet, in 1878, fed a patient through a gastric fistula.

Hernia of the stomach has been recorded by M. E. Ettmüller, A. Baraduc (Paris, 1837), P. Kirschbaum (Argentorati, 1749), Anseax (Paris, 1807), P. Bérard (Paris, 1835), J. Boyd (London, 1884, 1886), and W. Curran (1860).

Hour-glass stomach (*Sanduhrmagen*) was recognized and noted by: Lazarus Riverius (1589-1655); Gerardus Blasius (1628-1682), in 1677; Claudius Amyand (1732), Laurent Heister (1754), J. C. Reinmann (1756), J. B. Morgagni, Haller, Joseph Lieutaud (1703-1780); H. F. Delius (1778), Ed. Sandifort (1779), Sömmering, C. F. Ludwig (1785), E. L. Wernberger (1789, 1791); C. G. G. Kade (1798, 1800), Struthers (1851), Musser (1883), Chapotol ("L'Estomac et le corset", Paris, 1891), Schmid-Monnard (München. med. Wochenschr. No. 19, 1893), who diagnosed a case correctly during life, operation being followed by recovery; Jaworski ("Ectasia Ventriculi Paradoxa"), Franz Riegel, W. Saake (*Virchow's Archiv.* Vol. CXXXIV, 1894), Bouveret; Herz (Berlin, 1894); Ihrig (1895), Perret (1896); H. Weiss (1897); Eichhorst, Wolfer (1895), Carl Lauenstein (1896), and others.

Cases of interest have been reported by Georg Abraham Merclin (1671), Jobus Baster (1711-1775), in 1748, Georgius Ludovicus Rosa (1748) and Adamus Christianus Thebesius (1715). In 1789, Erasmus Ludovicus Wernberger (*Windsheimensis Physicus*) reported on "*De Ventriculo biloculari*" and referred to cases noted by Delius (1778) and Heister (1754). Brenner's interesting case of "Perforation eines runden Magengeschwürs in den linken Herzventrikel" appeared in *Wien. med. Wochensch.*, 1881. T. D. Lister's report of a case of a duodenal ulcer in *a baby three days old*, probably due to embolism from umbilical thrombi (as suggested by Landau in 1874) appeared in *Trans. Path. Soc.* Vol. I, p. 111, 1899. Oppenheimer's contribution, "Duodenal Ulcer," appeared in 1891. Mention might be made of the reports by Johannis Mauricii Hoffman ("De Vomitu Sanguineo ex vociferatione," 1694), J. G. Sommer ("De Ardore Ventriculi," Jan. 27, 1696), Maximilian Preuss ("Ventriculi perforati . . . ," 1715), Rheinhold Wagner (March 7, 1698), and Guntherus Christophorus Schelhammerus ("De Dysenteria Ulcerosa," 1697-1698).

Peptic ulcer of the esophagus was clinically diagnosed by Debove (1883-1887). Albers (1839) gave an early description of peptic ulcer of the esophagus and noted its similarity to gastric ulcer. Quincke (1879), of Kiel, studied three cases, microscopically, and suggested peptic etiology. The subject was reviewed by Beatrice Russell (1899), Tileston (1906), and Hellmann (1919). Humphry (1855) reported esophageal ulceration following burns. This condition was studied *esophagoscopically* by Starck (1905), Barclay (1915), Brunetti (1925), Fleischner (1925), Jackson (1929), R. Schindler, W. A. Swalm, F. Moutier, G. Tucker (Philadelphia), L. Clerf (Philadelphia), P. Alessandrini (Rome), and others.

Reference is made here to the recent articles by W. L. Palmer ["Benign and Malignant Gastric Ulcers: Their Relation and Clinical Differentiation," *Ann. Int. Med.* 13: No. 2, 317-338 (Aug.) 1939], of Chicago; and by Shay, Gershon-Cohen, and Fels, of Philadelphia ["The Role of the Upper Small Intestine in the Control of Gastric Secretion; the

Effect of Neutral Fat, Fatty Acid, and Soaps; the Phase of Gastric Secretion Influenced and the Relative Importance of the Psychic and Chemical Phases,"

PETRVS, FORESTVS, MED.

Above, Petrus Alcmarianus Forestus (1522-1597). Right, "De Ventriculi ulcere," Lib. XVIII, Obs. XXXIII, pp. 170-175, in *Observait. et Curationum Medicinalium*, Lugduni Batav., Plantiniana, 1594, Petrus Forestus, Ed.

Ann. Int. Med. 13: No. 2, 294-307 (Aug.) 1939]. In connection with the latter paper, mention should be made of the publications by D. M. Cowie [*Physician and Surgeon, Detroit and Ann Arbor,* 25: 241-252, 1903), Cowie and J. F. Munson, *Arch. Int. Med.* I: No. 1, 61-101, (Jan.) 1908]; Rhazes (850-923); and the *Isagoge* of Joannitius (809-873), an ancient text-book of medicine. Rhazes, the "Galen of the Arabs," provided an excellent maxim: "When you can heal by diet, prescribe no other remedy." In the *Isagoge,* in the discussion on foods, it is stated: "and of these the flesh of the middle sized animal (pork, beef, chicken, etc.) and more active kinds is better than that of the *fatter* and scaly varieties. Heavy foods produce phlegm and black bile, and either of these is evil."

Inflammatione ventriculus (gastritis)

OBSERVATIO XXXIII.

De ventriculi vlcere.

PVELLA quindecim annorũ, per biennium ferè cùm de dolore ventriculi conqueretetur, anno tertio tumorem manifestè viderunt parentes in eo loco: neque tunc quicquam consilij aut remedij tentatum. Hinc ruptionem animaduerterunt: excreuitq. puella materiam biliosam, pituitosam ac sanioſam per aluum: ex his apostema apparuit. Hæc cùm Bononiæ in Italia decumberet, tunc priùs vocatus est Elideus, medicus Hospitalis Bononiensis Vitæ dictę, præceptor meus. Is indicatione sumpta ab ætate, virtute, temperamento, loco malè affecto (quoniam locus vehementer sensibilis exiſtit) continuíque solutione; iudicauit necessariũ exiccantibus abstergentibusque vtendum esse, ac magna opus fore diligentia, tum quia locus est principalibus membris subministrans; tum quia toti corpori nutrimentum præparans. Quare loco potus & digestionis, præscripsit aquæ mellis vsum. Cibum verò facillimæ coctionis, exiguæ quantitatis, ex hordei cremore, nonnumquam ex panata, exiguo cinamomo adiecto: & aliquando vinum in pauca quantitate admisit. Pulsus huic erat creber, debilis, paruam habens inæqualitatem, vt fit in affectibus vẽtriculi: vrinæ albæ, crassæ, nõ coctæ. Stomachum inunxit oleo mastichino, cum lana succida applicando. Tertia die vidit eam lienteria laborare: & quemadmodũ Gal. 6. par. aph. 1. causam eius fore dicebat, vel imbecillitatem virtutis retentiuæ, vel vlcerationem ventriculi & intestinorum; sed præceptori certò persuasum fuit, hanc prouenire ab exulceratione stomachi, ob loci dolorem, ruptionem & sanioſam materiam; non ab ipsius virtutis debilitate. Ideò adhibuit fomentum exiccatiuum & constrictiuum; nempe ex absinthio, mentha, flor. ros. malicorio, gallis, balaustiis, myrtillis, mastiche, olibano. exhibendo præterea mĩuam coroneorum, cum quibusdam adstringentibus. Hinc tandem excrementa meliùs cocta visa sunt; & sanata est.

was discussed by Forestus (1595), Fr. Hoffmann (1706), Van Swieten, Colin (1771), Haymann (1779), Bode

(1780), Hennings (1781), Engelhart (1790), and Kretschmar (1795).

Of gastroenterologic interest are the *inaugural dissertations* by B. Krecklerus (1649), J. G. Pauli (1717), S. P. Hilscher (1732), J. van Strydonk (1736), Benedictus (1737), P. Ratell (1740), Buccardus (Basileæ, 1744), C. B. Voet (1750), and J. Athill (1782).

Dissertations on *gastralgia* are those by G. de Wolf (Gandæ, 1821), Blanchet (Paris, 1826), C. F. Mouroux (Paris, 1829), L. Potiez (Gandavi, 1829), C. Schneider (Pestini, 1830), J. P. Zimmer (Vindobonæ, 1833), P. Bessédes (Paris, 1833), Dufour (Paris, 1834), J. E. Légal (Paris, 1836), T. Mayer (Paris 1835), Finot (Paris, 1850), A. Prenger (Berlini, 1854), Gager (Paris, 1856), and "De Cardialgia Flatulenta," by H. Marchand (Agentorati, 1754).

Gastric disease was discussed by Furetiere (Paris, 1688), Huyberts (1653), Fonseca, Bierling, Henriquez, Primerosius, Salmuth (Cent. II, Obs. 6), Carminati (used magisterium bismuthi), Abrahamson, and Charles Badham ["Perforation of the Stomach," *London Med. Gaz. N. S.* 2: 119-120 (Apr. 9), 1841]. Wrisbergius published a report on "De nervis viscerum abdominalium" (10: Comment. Goetting., 15: p. 16).

USE OF STOMACH TUBE

The use of the stomach tube and the duodenal tube and the history of its development may be read in the interesting articles by Ralph H. Major [Ann. Med. Hist. 6: No. 6, 500-509 (Nov.) 1934], John R. Paine [Ann. Internal Med. 8: No. 6, 752-763 (Dec.) 1934], and J. Friedenwald and S. Morrison [Bulletin of the Institute of the History of Med. 4: No. 6, 425-454 (June) 1936].

CONCLUSION

In closing may I be permitted to quote from Roger Bacon's *Opus Majus* (page 583):

"Reasoning draws a conclusion but does not make conclusion certain, unless the mind discovers it by the path of experience."

May I add this from Shakespeare's *MacBeth* (Act V, Scene III):

MacBeth: Cure her of that:
Canst thou not minister to a mind diseas'd;
Pluck from the memory a rooted sorrow;
Raze out the written troubles of the brain;
And with some sweet oblivious antidote
Cleanse the stuff'd bosom of that perilous stuff
Which weighs upon the heart?

Doctor: Therein the patient
Must minister to himself.

MacBeth: Throw physic to the dogs, I'll none of it.

SUMMARY

The author's method of treatment of gastric and duodenal ulcer by nonsystemic antacid therapy (magnesium trisilicate, colloidal kaolin, and aluminum hydroxide), with results in several hundred cases, is described. A complete bibliographic study of ulcer of the stomach and duodenum, with case reports, from Galen to the present year, is given.

RÉSUMÉ

L'emploi du trisilicate de magnésie, du kaolin colloidal et de l'hydroxide d'aluminum dans le traitement gastrique anti-acide

La méthode de l'auteur de traiter les ulcères gastriques et duodénaux avec les resultats obtenus dans plusieurs centaines de cas est décrite en détail. Une bibliographie complète sur l'ulcère gastrique et sur l'ulcère duodénal depuis le temps de Galen jusqu'à nos jours accompagne l'article.

ZUSAMMENFASSUNG

Die Anwendung von Magnesium trisilicat Kolloidalem Kaolin und Aluminium hydroxyd in saüre bindender Magenbehandlung. Die Geschichte und Arten der Behandlung des Magen- und Zwölffingerdarmgeschwürs

Die Methode des Autors der Behandlung des Magen- und Zwölffingerdarmgeschwürs vermittelst unsystematischer saürebindender Therapie (Magnesium trisilicat, Kolloidalem Kaolin und Aluminium hydroxyd) mit Ergebnissen in mehreren hundert Fällen, wird beschrieben. Eine erschöpfende bibliographische Studie des Magen- und Zwölffingerdarmgeschwürs mit Berichten über Fälle von Galen bis zu Autoren der letzten Jahre ist ausgeführt.

SUMARIO

El uso de Trisilicato de Magnesio, Kaolín Coloidal, y Hidroxido de Aluminio en la Terapeutica Gastrica Antiácida. La Historia y Forma de Tratamiento de Ulcera del Estómago y Duodeno

El método del autor de tratamiento de úlcera gástrica y duodenal por terapeutica antiácida non-sistémica (trisilicato de magnesio, kaolin coloidal, y hidroxido de aluminio), con resultados en algunos cientos de casos, son descritos. Un estudio bibliográfico de la historia de la úlcera del estómago y duodeno, con casos reportados, desde Galeno hasta los escritores del año en cuerso, es presentado.

RIASSUNTO

L'uso del trisilicato di magnesio, kaolino colloidale, e dell'idrato d'alluminio nella terapia gastrica antiacida. Storia e metodi di trattamento dell'ulcera gastrica e duodenale

Viene riportato un metodo di trattamento dell'ulcera gastrica e duodenale coi sopraaccennati medicamenti, e il risultato in diversi centinaria di casi. Una completa bibliografia con presentazione di casi viene riportata.

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Correction

In the list of classes of members admitted to the International College of Surgeons at the last Convocation in New York City, appearing in the July issue of the Journal, the name of Dr. John W. Emhardt, of Indianapolis, Ind., was inadvertently classified as a Member. It should have appeared in the Fellowship list.

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Members of the Minnesota State Medical Association, under the leadership of the Association's council, paid tribute to the late **Drs. William J. and Charles H. Mayo** with a memorial pilgrimage on October 27 to Rochester. **Dr. George A. Earl,** St. Paul, president of the Association, presided at the ceremonies in Plummer Hall in the Mayo Clinic. **Dr. Edward L. Touhy,** Duluth, gave the address entitled, "An Expression from the Medical Profession of Minnesota." A procession to the cemetery followed.

Dr. Thomas A. Shallow, F.I.C.S., has been elected to the Samuel D. Gross chair of surgery at Jefferson Medical College. Before this appointment, Dr. Shallow was professor of surgery at Jefferson. The position has been vacant since the death in 1933 of Dr. John Chalmers DaCosta, who had held the chair from 1910. The Gross professorship was established in 1910 by Mrs. Maria Gross Horwitz, Baltimore, in honor of her father, professor of surgery at Jefferson from 1856 to 1882. Dr. Shallow was graduated from Jefferson in 1911.

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Professor Joshua Harold Burn, professor of pharmacology at the University of Oxford, has been nominated to be for five years a member of the General Council of Medical Education and Registration in the United Kingdom in succession to **Sir George Newman.**

INDIVIDUALIZATION OF THE TREATMENT OF FRACTURE OF THE NECK OF THE FEMUR IN THE AGED

PROF. DR. HERMAN DE LAS CASAS, F.I.C.S.

Head of Department of Traumatic and Orthopedic Surgery,
Central University of Venezuela

CARACAS, VENEZUELA

FRACTURES of the neck of the femur were, for years, dreaded at our department. We had many unfavorable end results. In the last few years, however, our final results have been so much more satisfactory that, even though we may not have solved the problem, at least we believe that we are on the right path.

This paper will be but a brief summary of our experiences during the last few years. It is being presented as a preliminary résumé of a more detailed report which will appear later.

REASON FOR INDIVIDUAL TREATMENT

Our previous failures have guided us to our present conclusions. Many times, very similar cases produced entirely dissimilar end results. Sometimes what appeared to be an excellent result early, was found to be a failure when the patient returned a few months later with a flattened femoral head and a painful hip.

At last we understood. Our whole problem was one of the *blood supply to the capital fragment.* Whenever well immobilized, aligned and impacted fragments failed to unite, roentgenological signs of necrosis of the femoral head were found.

We decided, therefore, to do an open operation in every case so that we might inspect directly the blood supply of the fragments. The useless necrotic heads were removed and studied; our findings from these studies will be published in a later, more complete report.

The following facts presented themselves to us: (1) *In some fractures, all the important vessels supplying the femoral head were destroyed;* (2) *in other cases, enough vessels to nourish the head were spared.*

In group one the head develops an ischemic necrosis, therefore no union can be expected. In group two, however, the head survives and union is possible.

This difference explains the need for individualization of treatment, depending upon the condition of the capital fragment. If the head can survive, union and an anatomical result should be sought. If, however, the head is necrotic, then it cannot unite, and only a functional result should be expected.

There are still other reasons for individualizing the treatment. While some patients are strong enough to stand a serious operation, others are too frail to be exposed to such danger. Also the local conditions are different in fresh and old fractures, and this factor requires special consideration. Still other reasons, too numerous and too well known to all of you, may cause the surgeon to vary the treatment. To review all of them would carry us too far afield. We wish to report only a broad outline of what we believe to be the most important facts.

RECENT FRACTURES

In youth, the ligamentum teres is a blood vessel carrier, but in aged people, it suffers sclerosis so that the amount of blood passing through it is negligible and quite incapable of fulfilling the needs of the femoral head. In the aged, all the

important blood vessels of the proximal portion of the femur come from the shaft and from the synovial and capsular branches of both circumflex arteries. All these arteries run from a lateral source toward the medial portion of the epiphysis of the head. Therefore, any fracture through the neck cuts these arteries at the site of the fracture as they run inside the bone. As a result, *the head receives blood only from those arteries that enter the neck proximal to the line of fracture.*

The most proximal of the vessels capable of nourishing the head enter the neck a few millimeters distal to the cervicocephalic line. Consequently, any fracture of the neck passing between these vessels and the head (proximal to the entry of the vessels) leaves the head without nourishment and causes its necrosis.

Fractures whose lines pass lateral to the entrance of the vessels mentioned are: (1) lateral or distal fractures, consisting of the varieties classically known as "trochanteric" and "cervico-trochanteric" and some of those known as "meso-cervical"; (2) medial or proximal fractures, those fractures whose lines pass medial to the entrance of the vessels mentioned, consisting of some of the "meso-cervical" and "cervicocephalic" varieties of the classics.

1. *Lateral Fractures (Distal).* In this variety, the nourishment is sufficient; therefore, the head survives and union is possible. Thus an anatomical result can be expected in this variety if proper apposition of the fragments is obtained and maintained.

Perhaps a long period of immobilization in a cast would suffice, but in the aged we dread such immobilization more than an operation. We treat these cases by operative fixation done under local anesthesia. We do not believe it necessary to operate through an arthrotomy.

We do a "blind" fixation operation, using constantly radiological guidance. The technique varies according to the general condition of the patient. If the patient is strong, we prefer to do the fixation with an autogenous graft, using a special set of instruments, designed by us, which eases the task remarkably. These we will describe in our complete report. In *weak patients* we use a metallic nail and thus spare the patient the shock caused by removing an autogenous graft. We like the Sven Johansen nail, which is so well known as to need no description.

2. *Medial Fractures (Proximal).* In this variety, the nourishment is insufficient; therefore, necrosis of the head occurs, and no union can be expected, regardless of the type of treatment employed. Pseudarthrosis follows, and a painful hip, with great incapacity, results. Therefore, in these cases, *we take out the dead head* to make a place for the lateral fragment of the neck, which is fairly long in these cases and can be placed into the acetabalum to support it. Experience has taught us that enough adhesions and scar tissue contractions are formed to keep the neck in place so that the new joint is sufficiently stable. Of course, the patient limps, and has the so-called "gluteal gait," caused by the diminishing of the distance between the insertions of the pelvitrochanteric muscles. Nevertheless, he is able to walk, sit down, kneel, etc. In brief, he has enough hip function to carry on the reduced activities of an old man.

In *weak patients* we do nothing more than excise the head under local anesthesia. In *strong patients* we correct the incapacity by a subtrochanteric osteotomy, performed at the same time as the extraction of the head, through the same incision, and all under local anesthesia. The distal (lower) fragment of the femur is placed in abduction. This reestablishes the proper length of the muscles inserted upon the greater trochanter and places the neck stump in a very good position for weight bearing, namely, so that the forces pass through its axis. Immobilization, of course, is

necessary because of the osteotomy. It is for this reason, above all, that we do it only in strong patients.

Diagnosis of the Variety of Fracture. In most cases, the position of the line of fracture is sufficient to determine whether one is dealing with a medial type in which the head is necrotic or a lateral type in which the head will survive.

When the line passes a few millimeters lateral to the head, in the zone in which the last vessels enter the neck, it is more difficult to decide.

Fortunately, the necrosis of the head can be detected on the roentgenogram after some days. In the case of a fresh fracture, the upper extremity of the femur, because of the lack of weight bearing, suffers a certain degree of decalcification, visible in a good film. If the capital fragment is isolated from the rest, because its vascular connections are cut, it will not participate in the process of decalcification. That makes the head seem more dense than the lateral fragment.

Also, if still in doubt, one can operate through an arthrotomy and directly examine the vascularization of the fragments before deciding on the operation to be performed.

If the patient is too frail, or if there is any other reason not to perform the arthrotomy, one can do the fixation as if it were a lateral fracture. In case of failure, it is still possible to remove the head.

OLD FRACTURES

In old fractures, the local conditions are different enough to require another line of conduct. An old fracture can need treatment because of (1) nonunion or (2) malunion.

1. *Nonunion.* The first step is to see whether the head is dead, that is to say, whether it was a lateral or a medial fracture. Sometimes it is impossible to judge from the length of the fragments because of resorption, but at this time it is always possible to judge according to the density.

In *lateral fractures,* just as in fresh fractures, if the head is living, union can be expected. However, unlike the fresh fractures, the two fragments are healed and are separated from each other. To promote union, it is necessary to freshen the fragments. This requires an operation through an arthrotomy which can be performed under local anesthesia. Arthrotomy was not necessary for union of fresh fractures.

In *medial fractures* the head is dead and must be removed. However, in old fractures the neck has suffered resorption and is very much shortened. It cannot support the acetabulum. The upper extremity of the trochanter could be placed under the rim of the acetabulum, to bear the weight, but in the movements of adduction luxation would occur. We freshen the surfaces of both the trochanter and the acetabulum. A fibrous union, or even a bony union, develops between them. The patient will have a stiff hip, but good function will result. Every surgeon has seen such cases of stiff hip joint, caused by arthritis, with good function.

2. *Malunion.* The condition is a "coxa vara traumatica." As the *medial variety of fracture* is not capable of union (good or bad) because of the dead head, only the *lateral fracture* is to be considered.

The difficulty comes in this case, as in any other coxa vara, from the lack of distance between the insertions of the pelvitrochanteric muscles and their origins. By means of a subtrochanteric osteotomy, the proper distance between the insertions and their origins can be reestablished.

RECAPITULATION

The methods of treatment may be summarized as follows:

1. *Fresh Fractures:*
   - A. Lateral: head living; union possible: *internal fixation*
     - a. Weak Patient: metallic nailing
     - b. Strong Patient: autogenous pegging

B. Medial: head dead; union impossible: *excision of head*
   a. Weak patient: excision only
   b. Strong patient: excision plus osteotomy

2. *Old Fractures:*

A. Nonunion:
   a. Lateral fracture: internal fixation by arthrotomy
   b. Medial fracture: excision of the head and ankylosis

B. Malunion:
   Lateral fractures only: coxa vara traumatica: subtrocantheric osteotomy.

Of course, this is only a brief account of the matter in which only the more general facts are reported. It will be followed by a detailed report, with all the documents (including roentgenograms, illustrations of anatomical pieces and 3,200 feet of 16 mm. film).

This paper should be considered only as a summary. There are many more possibilities to be taken into account. For instance, it is perhaps possible for a fresh medial fracture, deeply impacted, to unite satisfactorily. It may be possible for the vessels of the lateral fragment to grow into the medial fragment, as if it were a graft. Of course, this cannot be the general case, and it is much safer to count upon the necrosis of the head.

The value of the methods herein reported are shown by the fact that since we have adopted them our results have changed completely.

SUMMARY

Methods of treatment of fracture of the femur in the aged, depending upon whether the head of the femur is living and the blood supply therefore adequate or whether the head is dead and the blood vessels destroyed, are described. Results have changed completely since the institution of these methods.

RÉSUMÉ

Individualization du traitement des fractures du col du fémur survenant chez les vieillards

Les méthodes de traitement des fractures du col du fémur sont discutées et étudiées. L'état de la tête du fémur et de sa vascularisation adéquate ou non nous guidera dans le choix de la methode à employer. Les resultats obtenus par l'auteur ont été fortement améliores depuis l'adoption de cette ligne de conduite.

ZUSAMMENFASSUNG

Individualisierung der Oberschenkelhalsfrakturbehandlung bei alten Patienten

Der Verfasser beschreibt die Methoden der Oberschenkelhalsfrakturbehandlung bei alten Patienten die entweder darauf beruhen dass der Oberschenkelkopf lebt und seine Blutversorgung genügend ist, oder ob der Kopf tot ist und die Blutgefässe zerstört sind. Die Ergebnisse haben sich vollkommen geändert seit der Anwendung dieser Methoden.

SUMARIO

Individualización del Tratamiento de Fracturas del Cuello del Femur en Personas de Edad

El método de tratamiento de fracturas del cuello del femur en el viejo, dependiendo en la vida de la cabeza del femur debido á irigación adecuada ó la muerte de la misma por destrucción de los vasos, es descrita. Los resultados han cambiàdo completamente desde la institución de éste método.

RIASSUNTO

Individualizzazzione del trattamento della frattura del collo del femore, nei vecchi

Vengano discussi e studiati i metodi di trattamento della frattura del collo del femore nei vecchi. Lo stato della testa del femore e la sua vascolarizzazzione adeguata o no, guideranno alla scelta del metodo da usare. Con l'adozione di simile procedura, i risultati della cura sono assai più saddisfacenti.

ARTHROPLASTY OF THE TIBIOTARSAL ARTICULATION

AUTHOR'S METHOD

DR. ABELARDO IBAÑEZ BENAVENTE

LA PAZ, BOLIVIA

TIBIOTARSAL ankylosis is a joint affection which is particularly distressing to the patient and especially so when such fixation has left the foot in an extended or equine position. This position, when exaggerated, is called "dancer's foot" because of its similarity to that assumed by a toe dancer. The awkwardness and disability resulting from such an ankylosis is extreme, for in order to rest the sole of the foot partially or completely on the ground the patient has to maintain the affected limb permanently in flexion, the thigh on the trunk and the leg on the thigh.

CAUSE OF DEFORMITY

Unfortunately this type of ankylosis, when following an arthritic affection of the tibiotarsal joint, is often due to failure on the part of the surgeon to immobilize the joint at right angles, the optimum position should ankylosis result. For this reason right angle immobilization should be carried out in the presence of any arthritic process of this joint, regardless of the etiology of the affection. In many patients wounded in the Chaco War unfortunate results followed improper immobilization.

The patient bears deformity by ankylosis with the foot at right angles more easily than with the foot in another position because of compensatory movements in the other joints of the foot, such as the intertarsal, metatarsal and metatarsophalangeal. In any case it is a distressing condition and produces a marked claudication.

METHODS OF CORRECTION

Many surgical procedures have been devised to lessen the deformity and overcome the disability resulting from this type of ankylosis. Ollier practiced both astragalectomy and reparatory resection. Hexer performed an arthroplasty requiring the section of the anterior tibial ligament and the extensor proprius. Reich, Hoffman and Schepeliami inverted the form of the articular surfaces.

AUTHOR'S METHOD

The operation which will be described now is an arthroplasty which was devised by the writer and was used in all cases of ankylosis of the tibiotarsal joint treated during the Chaco War in the Banco Central Hospital for Plastic Surgery. The operation is somewhat difficult to perform because of the relative inaccessability of the tibiotarsal articulation, but this has been made somewhat easier by selecting the lateral approach after temporary resection of the malleolus of the fibula. The functional results have been very satisfactory.

Incision. The foot to be operated upon is placed with its medial surface resting on a sandbag. A semicircular incision (Fig. 1) 10 cm. long is made through the skin and subcutaneous tissue with the external malleolus as the center. The tendons of the peroneus longus and brevis are separated from their sheaths and retracted (Fig. 2). At a point about 3 cm. from the apex of the malleolus of the fibula a Gigli saw is introduced between the tibia and fibula and the fibula then is sawn through, upwards and outwards, forming an oblique surface which will insure perfect bone coaptation when reunited after the operation. The

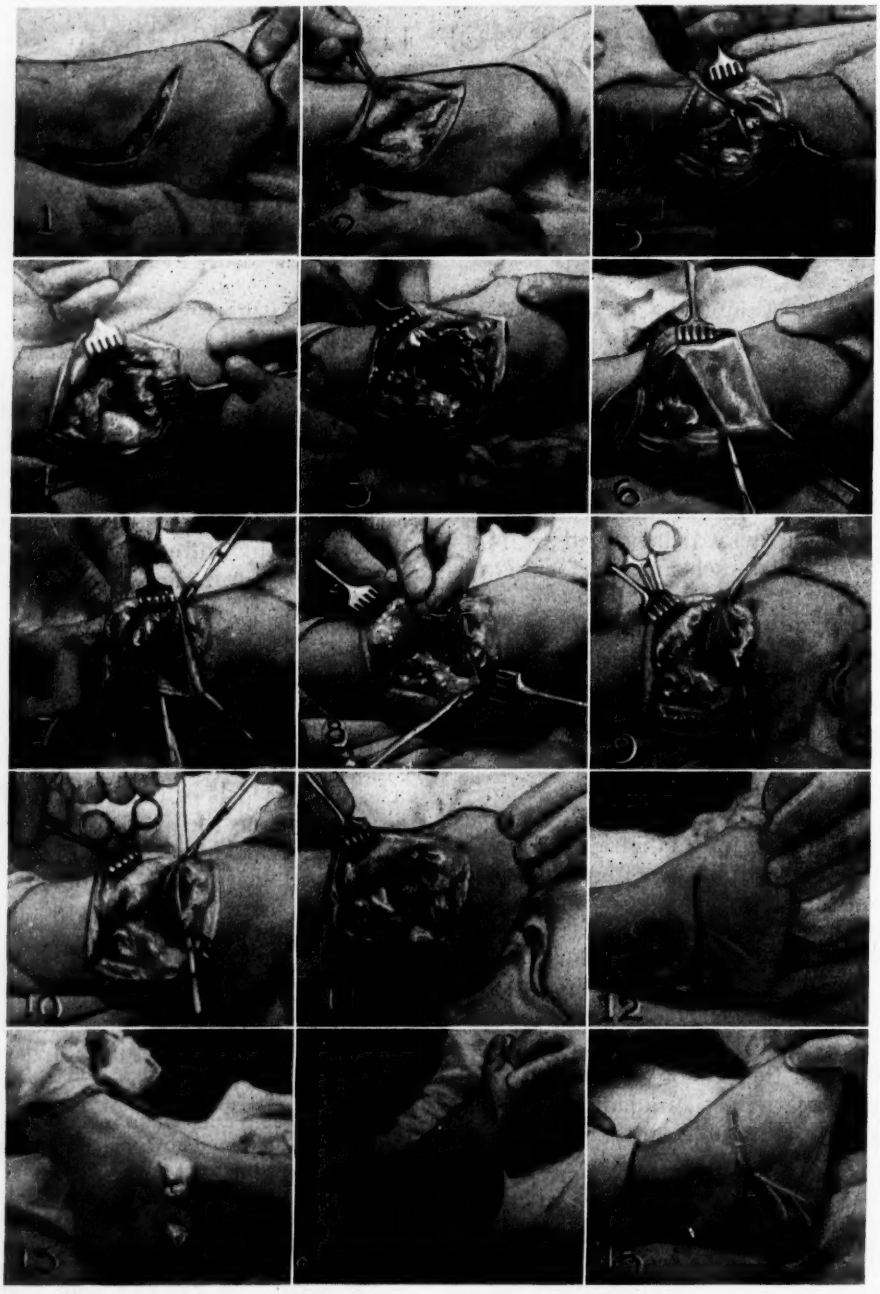

Fig. 1, Incision for tibrotarsal joint arthroplasty. Fig. 2, Retracted flap. Fig. 3, Separation of bones with Putti chisel. Fig. 4, Synosteosis following separation. Fig. 5, Spnosteosis after chiselling. Figs. 6-7, Introduction of fascia flap. Figs. 8-10, Fixing fascia flap. Fig. 11, Fascia flap in place. Fig. 12, Approximation of wound edges. Fig. 13, Gauze compress holding fascia flap in place. Fig. 14, Result: Foot at right angles; horsehair drain in place. Fig. 15, Finished arthroplasty, lateral view.

malleolus is dissected downward, care being taken not to separate it from the external lateral ligament, which by its insertion at its tip serves as a hinge to aid its downward rotation. The cut malleolus should be covered with a wet sponge while the operator proceeds to expose the entire external lateral surface of the tibio-astragalar synosteosis. The periosteum covering this synosteosis, after having been cut in the direction of an imaginary line between the two bones, is separated for a moderate distance. All the tissues and tendons on the anterior surface of the articulation are separated subperiosteally with the aid of wide retractors until a complete exposure of the anterior surface of the tibio-astragalar articulation is obtained.

Separation of Bones. A Putti chisel of the proper curvature is used to separate the bones (Fig. 3). Beginning at the anterior surface of the articulation this separation should follow as closely as possible the normal form of the astragalus and the articular surface of the tibia. While using the chisel to open the synosteosis, slight downward traction should be applied to the foot with countertraction on the leg. After the bones are separated completely (Fig. 4) their bony surfaces are exposed, the inferior surface being convex, the superior one concave, with the axes of both directed anteroposteriorly. These articular surfaces now should be made very smooth and even. This is best done with special files. When the operator is working on the tibial surface the lower end of the tibia should be pushed downward and forward by means of a lever placed behind it. The procedure is completed when the convex surface of the tibia fits evenly against the concave surface of the astragalus, imitating a normal articulation and allowing free gliding between both surfaces. The surfaces are then dried and the field cleaned of any loose shreds of connective tissue (Fig. 5).

Interposition of Flap. For the interposing flap a piece of fascia lata of the required size is removed from the patient. Because of the depth to which this flap must be inserted, this procedure requires a somewhat special technic. The piece of fascia lata is first folded on itself and then the folded side is inserted between the articular surfaces by means of two Kocher forceps which hold them in place until they have become fixed in position by sutures (Figs. 6 and 7). These sutures are of heavy chromic catgut introduced by long straight needles. The first one is passed between the layers of the flap, through its folded edge and through the soft tissues of the median side of the instep, where it emerges. The other end of this suture is passed in a similar manner so that when the two ends are tied together they form a mattress suture which anchors the folded part of the flap securely in place. Two more sutures suffice to anchor the folded end of the flap. In those cases in which the articular surfaces are especially deep the sutures may be introduced from without inward rather than from within outward.

When the folded edge of the flap has been anchored, the two free layers are ready to be sutured at their circumference to the joints which they overlie. Interrupted sutures of catgut fasten them to the fibrous tissue which was purposely dissected free in the early stage of the operation. In suturing the flap over the tibular end, a small portion should be left at the point of attachment for the fibula; this portion, after suture of the cut ends of the flap, is fixed to the tibia by means of Parham-Putti tape. (See Figs. 8-11.) The joint then is reconstructed.

Before closing the fibrous tissue and skin a horse hair drain is inserted into the wound to drain any secretions through the lateral side of the foot. The foot is then bandaged so that it is maintained in a right angle position. (See Figs. 12-15.)

POSTOPERATIVE CARE

Dressings are changed on the first postoperative day, the drain is removed on the second or third, and passive motion of the foot is begun on the seventh. On the fifteenth massage is commenced and physiotherapy is instituted, while on the twentieth postoperative day gradual weight bearing is allowed. Within the next few days the patient is able to walk with aid of crutches or canes.

SUMMARY

The author describes, step by step, his method for arthroplasty which he uses in cases of ankylosis of the tibiotarsal joint. He has simplified this operation by selecting the lateral approach after temporary resection of the malleolus of the fibula. Functional results have been very satisfactory.

RÉSUMÉ

L'Arthroplastie de l'articulation tibia-tarsale

L'auteur décrit minutieusement la méthode d'arthroplastie à laquelle il a recours dans les cas d'ankylose de l'articulation tibia-tarsale. Il a simplifié l'opération en choisissant l'approche latéral après résection temporaire de la malléole externe. Les résultats fonctionnels sont très satisfaisants.

SUMARIO

Artroplastia de la Articulación Tibiotarsal

El autor describe, paso por paso, su método por artroplastia el cual el usa en casos de anquilosis de la articulación tibiotarsal. El ha simplificado ésta operación eligiendo el aproche lateral despues de resección temporaria de el maleolo de el peroné. Los resultados funcionales han sido muy satisfactorios.

ZUSAMMENFASSUNG

Arthroplastie des Tibio-Tarsal-Gelenkes

Der Autor beschreibt schrittweise seine Arthroplastiemethode, die er bei einer Versteifung des Tibio-Tarsal-Gelenkes anwendet. Er vereinfachte diese Operation dadurch, dass er das Gelenk von lateral angeht, nachdem er den Knöchel der Fibula vorübergehend reseziert hat. Die funktionellen Ergebnisse sind sehr gut.

RIASSUNTO

Artoplastica dell'articolazione tibio tarsica

L'A. descrive, passo per passo, il suo metodo di artoplastica nei casi di anchilosi della articolazione tibio tarsica. Egli ha semplificato questa operazione, nello scegliere la via laterale, dopo resezione temporanea del malleolo delle fibula. I risultati funzionali sono stati molto soddisfacienti.

—o—

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INTERRELATIONSHIP OF SURGICAL CONDITIONS OF THE PELVIC AND ABDOMINAL VISCERA

ILLUSTRATIVE CASES*

WILLIAM SEAMAN BAINBRIDGE, A.M., Sc.D., M.D., C.M., F.I.C.S.

NEW YORK

THE subject of specialization is one that is reverted to again and again by writers in the field of medicine and surgery. The old horse-and-buggy doctors who handled all mental and physical ills which they were called upon to treat were really the advanced thinkers and pioneers in their art. It is the specialists who are reactionary in a sense, for they may follow the laws of ancient Egypt whereby each physician treated but one part of the human body, without consideration of the human mechanism as a whole.

One cannot gainsay the fact that specialization has its great advantages, for it has resulted in epoch making progress. But it is not an unmixed blessing for, as in every other field of endeavor, ultra specialization in surgery may actually limit the horizon of the surgeon often to the detriment of the patient.

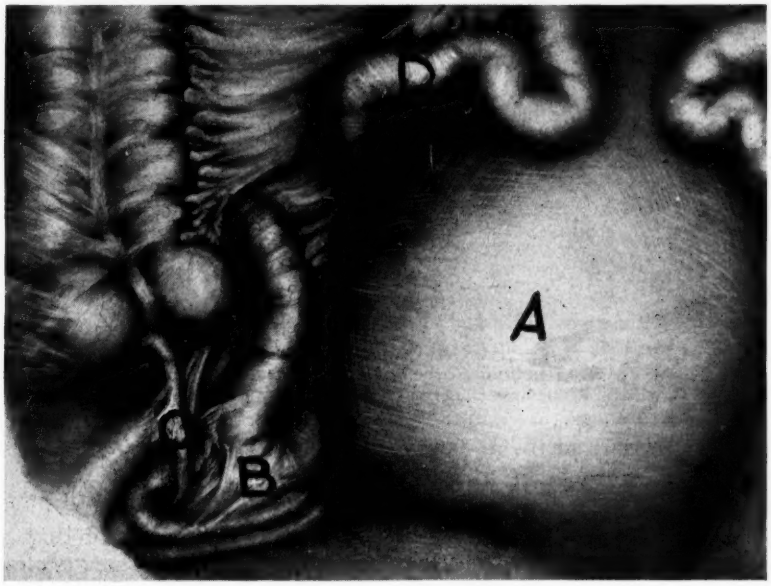

Fig. 1. Case I: C.I.A. *A*, fibroid uterus. *B*, kinked ileum, with adhesions. *C*, appendix. *D*, distended loop of ileum proximal to site of partial obstruction.

There are so many conditions of the pelvic cavity that are correlated with pathology in the upper abdomen, and vice versa, that any surgeon entering either cavity should be able to cope adequately as far as possible with conditions that are present in the entire area. It is often a matter of judgment, when there is much pathology present, to determine which is of primary importance and which secondary. This is not always a simple matter, as the writer has found

*Read at Annual Meeting of the Amer. Ass. of Obst. Gyn. and Abd. Surg., Sept. 7-9, 1939, Hot Springs, Va.

in his experience; but he would feel himself handicapped and thwarted if his horizon did not encompass that which is above the pelvic brim as well as below it.

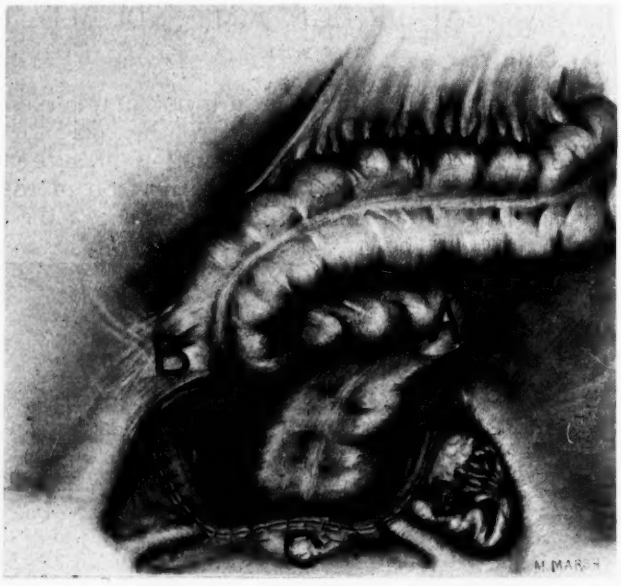

Fig. 2. Case I: C.E.A. *A*, sigmoid. *B*, adhesion of sigmoid to right side above pelvic brim. *C*, shell of cervix with line of sutures, following hysterectomy. *D*, normal left tube and ovary.

The visceral anatomy of the abdomen and pelvis, when studied in a prone body, does not always give a correct picture of many conditions from which the patient suffers. The surgeon must visualize the organs in the upright position and the effect of sitting or walking two-thirds of the daily twenty-four hours. In demonstrating the importance of this point the writer often has placed the patient with the abdomen open, in the Trendelenburg and then in the reverse Trendelenburg positions. Conditions otherwise obscured or apparently absent then come into view and can be dealt with more adequately.

From some thousands of abdominal sections, I have selected a series of cases to present to you to demonstrate the points of this paper. A number of the cases operated upon many years ago are especially given so that end results may be noted. In my files I have the clinical history, physical examination, roentgenologic findings, laboratory reports and drawings of exact conditions found at time of operation, of over a thousand selected laparotomies.

I wish to emphasize that abdominal and gynecological surgery are in the same family and that any limited viewpoint on the part of the ultra-specialist may cripple his surgical work, with often the same effect on the patient.

CASE REPORTS

CASE I. C.E.A.: 44; female; married.
Operation: December 9, 1913.

Conditions found:

1. Uterine fibroid, size of six months' pregnancy.
2. Cystic right ovary.
3. Extensive adhesions between cecum and right half of anterior abdominal wall, between sigmoid and lower ileum and right broad ligament, binding down appendix to posterior wall of pelvis.

Surgical procedure:
1. Supravaginal hysterectomy, Bland Sutton method.
2. Right ovary and tube removed.
3. Appendectomy.
4. Adhesions relieved. Raw surfaces turned in as far as possible.

Result: Excellent health many years; then lost track of.

CASE II. M.H.: 41; female; widow.
Operation: January 21, 1922.

Conditions found:
1. Appendix chronically inflamed.
2. Diverticula of cecum.
3. Multiple fibroids of uterus.
4. Cystic ovaries.

Surgical procedure:
1. Appendectomy.
2. Plication of cecum.
3. Panhysterectomy.

Result: Since operation and up to the present time has been in perfect health.

CASE III. F.M.B.: 37; female; married.
Operation: March 18, 1914.

Conditions found:
1. Mucous ulcer in center of lesser curvature of stomach.
2. Broad band of adhesions from proximal half of appendix to pelvis.
3. Adhesions between ascending colon and right parietal peritoneum, causing partial obstruction, and dilatation of ileum from back pressure.
4. Left ovary buried in mass of adhesions attached to sigmoid colon, causing marked angulation.

Surgical procedure:
1. Gastric ulcer enfolded.
2. Abdominal adhesions relieved.
3. Left ovary freed from bed of adhesions; cysts removed; remaining portion stitched to broad ligament.

Note 1. Condition of patient was such as to preclude necessary pelvic repair at this time.

Note 2. April 14, 1914 (while patient was still in hospital) divulsion and curettage, anterior colporrhaphy and perineorrhaphy performed.

Result: Patient in excellent health for 14 years; then lost track of.

CASE IV. H.C.: 37; female; married.
Operation: June 26, 1915.

Conditions found:
1. Last kink of pelvic colon markedly accentuated.
2. Thickened peritoneum, three inches above normal terminal kink, bound down descending colon, causing angulation.
3. Appendix absent.
4. Great omentum adherent over left ovary, being attached to tube and lateral wall.
5. Uterus enlarged; contained five fibroids.
6. Part of right ovary and tube absent; remaining portion diseased and matted down by adhesions.

Surgical procedure:
1. Adhesions and points of angulation relieved.
2. Uterus and remains of right ovary and tube removed.

Note: Patient had been advised by three surgeons to have double mammectomy for possible cancer. Believing that in this case breast condition was due to pathology in abdomen and pelvis, operator decided against surgical intervention on the breasts until effects of abdominal operation were noted.

Result: Patient regained perfect health and breast pathology completely disappeared.

CASE V. W.C.T.: 31; female; married.
Operation: November 10, 1922.

Conditions found:
1. Intestines on right side adherent to abdominal wall at site of previous celiotomy.
2. Cecum rotated by bands.
3. Lower part of small bowel adherent tightly to fundus uteri, another loop adherent to second point of fixation on posterior wall of uterus, causing almost complete obstruction.
4. Appendix, left ovary, and tube absent.
5. Uterus retroflexed.

Surgical procedure:
1. Abdominal adhesions relieved.
2. Intestine detached from uterus; raw surface covered.
3. Johnson-Willis suspension of uterus.

Result: At end of seven years reported in perfect health.

CASE VI. M.W.: 68; female; married.
Operation: May 10, 1913.

Conditions found:
1. Omentum adherent to peritoneum over bladder.
2. Thickened appendix attached to omentum at same point.
3. Transverse and ascending colon bound tightly together by omental adhesions.
4. Uterus double normal size; carcinoma of body, irremovable.
5. Webbed adhesions from old inflammation over tubes and ovaries.

6. Enlarged lymphatic glands along pelvic vessels; evidently extension of malignancy.

Surgical procedure:

1. Abdominal adhesions relieved.
2. Appendix removed.

Conditions found:

1. Left tube, bladder, loop of ileum, and two points of pelvic colon adherent to fundus uteri.
2. Degenerated fibroid adherent in culdesac.
3. Sac of pus between bladder and uterus.

Fig. 3. Case VI: M.W. *A*, omentum adherent to bladder. *B*, appendix attached to great omentum. *C*, pericecal adhesions. *D*, adhesions of great omentum to ascending colon. *E*, dilated, obstructed ileum.

3. Starvation ligature and lymphatic block, with removal of lymphatic glands from receptaculum chyli to obturator foramina.

Note: Operation purely palliative to relieve intestinal obstruction which was fast becoming acute.

Result: Patient relieved of agonizing pain, of toxic absorption, of uterine hemorrhage. Gained in weight and was very comfortable during year of life following operation.

Case VII. F.J.: 65; female, widow.

Operation: February 17, 1915.

4. Terminal ileum fixed by inflammatory bands.
5. Tip of appendix fixed to uterus by adhesions.

Surgical procedure:

1. Intestinal adhesions relieved.
2. Appendectomy.
3. Viscera detached from uterus.
4. Panhysterectomy.

Result: Excellent. Last heard from 16 years after operation; 81 years of age. Perfect health except for fractured hip.

CASE VIII. W.S.A.: 44; female; married.
Operation: January 22, 1915.

Conditions found:

1. Postoperative hernial sac, size of orange, containing adherent omentum, divided into number of compartments by adhesions.
2. Right side of great omentum adherent to apex of bladder, middle portion adherent to scar of previous abdominal operation, and left side amalgamated with abdominal wall and hernial sac.
3. Cecum elongated, mobile, prolapsed into pelvis.
4. Appendix, left ovary, and tube absent.
5. Peritoneal band of adhesions from last kink of pelvic colon and left broad ligament grasped loop of rotated small bowel, forming fixed chronic volvulus.
6. Band of adhesions from fundus uteri attached itself to same loop of small intestine at a distance of 7 inches from other band, holding intestine firmly in rotated position.
7. Right ovary atrophic; right tube adherent to horn of uterus and kinked on itself.
8. Adhesions around gallbladder.

Surgical procedure:

1. Herniotomy.
2. All adhesions relieved.
3. Organs placed in proper position.

Result: Excellent recovery.

CASE IX. W.W.C.: 38; female; married.
Operation: January 13, 1915.

Conditions found:

1. Great omentum attached to abdominal wall below umbilicus and to ascending colon from cecum to hepatic flexure. Omentum also attached to coils of small intestine which were, in turn, attached to each other.
2. Appendix absent.
3. Extensive adhesions between last three inches of ileum, the cecum and cyst of right ovary, Fallopian tube and wall of pelvis.
4. Uterus enlarged; contained a number of fibroids.
5. Large serous cyst, probably parovarian,

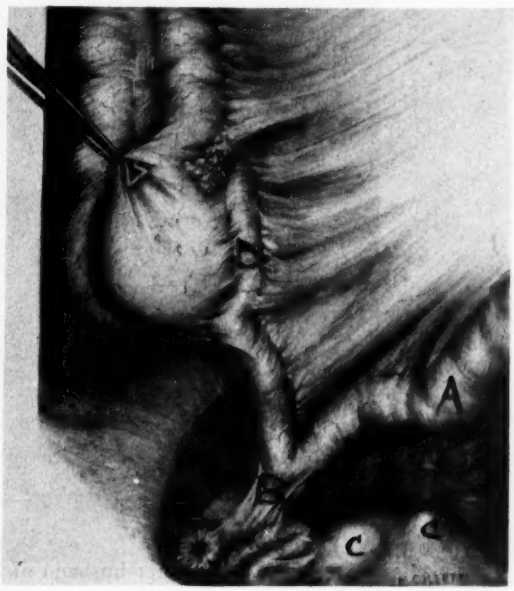

Fig. 4, left. Case IX: W.W.C. *A*, partially obstructed ileum. *B*, adhesion of ileum to right ovary and tube. *C*, uterine fibroids. *D*, terminal ileum adherent to cecum.

Fig. 5, right. Case IX. W.W.C. *A*, omentum attached to and twisting colon. *B*, adhesions, small bowel. *C*, stomach pulled down and fixed to abdominal wall.

situated in region from which left tube and ovary had been removed at previous operation. Cyst adherent to posterior wall of abdomen and intestinal coils; shutting off true pelvic cavity.

Surgical procedure:

1. Right ovary, tube, uterus, left parovarian cyst removed *en masse*.
2. Abdominal adhesions relieved; raw surfaces too extensive to be covered by suturing; sterilized liquid paraffin distributed over area.

ment, to round ligament on left side, and in circular direction toward pelvic colon, causing considerable obstruction.

5. Band from cecum to right broad ligament.
6. Appendix absent.

Surgical procedure:

1. Adhesions relieved.
2. Uterus freed; Johnson-Willis suspension.
3. Appendices epiploicae removed.

Result: Patient continued very well for 17 years; then following severe accident, began

Fig. 6. Case XIII: M.O. *A*, ovarian cyst. *B*, kinked, inflamed right tube. *C*, pelvic colon attached to Fallopian tube.

Result: Excellent. Ten years later husband of patient, a physician, reported that since operation wife had been in perfect health.

CASE X. H.E.H.: 29; female; married.
Operation: October 13, 1916.

Conditions found:

1. Uterus anchored towards left by strong ligament, firmly attached to abdominal wall (evidently attempt at ventral suspension at previous operation).
2. Two appendices epiploicae attached to ligament, rotating pelvic colon to outer side.
3. Congested left tube and ovary; otherwise normal.
4. Band between abdominal wall and pelvic colon, situated three inches below beginning of accentuated last kink, extended from brim of true pelvis, on broad liga-

to have marked pelvic and abdominal pain, necessitating operation in another city. In excellent health at present time.

CASE XI. W.S.L.: 34; female; married.
Operation: April 16, 1913.

Conditions found:

1. Cecum adherent to right parietal wall, to transverse colon and to peritoneum in right iliac fossa.
2. Appendix absent, except butt end, which was free.
3. Below ileocecal valve, band forming an X, ran to iliac fossa and involved right ovary.
4. Fibroid tumor of uterus.
5. Cysts of right ovary.
6. Sigmoid colon adherent to left round ligament, to broad ligament and to left side of pelvic wall.

Surgical procedure:

1. Stump of appendix removed.
2. Adhesions relieved.
3. Ovarian cysts punctured.
4. Fibroid of uterus removed.

Result: Excellent. Patient regained perfect health.

CASE XII. M.T.S.: 24; female; married.
Operation: January 29, 1915.

Conditions found:

1. Lane's band of terminal ileum forming a V, lower end of which was in true pelvis.
2. Great omentum bound transverse colon tightly to abdominal wall and to scar of previous celiotomy, to right broad ligament, and to right ovarian cyst.
3. Tube on right side kinked and inflamed.
4. Adhesions from pelvic colon to posterior wall of broad ligament and to left tube, kinking it.
5. Last loop of pelvic colon attached to Fallopian tube.
6. Marked ileopelvic band from free margin of terminal ileum to pedicle of ovarian cyst; band so tight it had rotated terminal ileum so that upper surface of mesoappendix lay almost downward.
7. Appendix thickened; contained fecal pus.
8. Rectocele and cystocele.

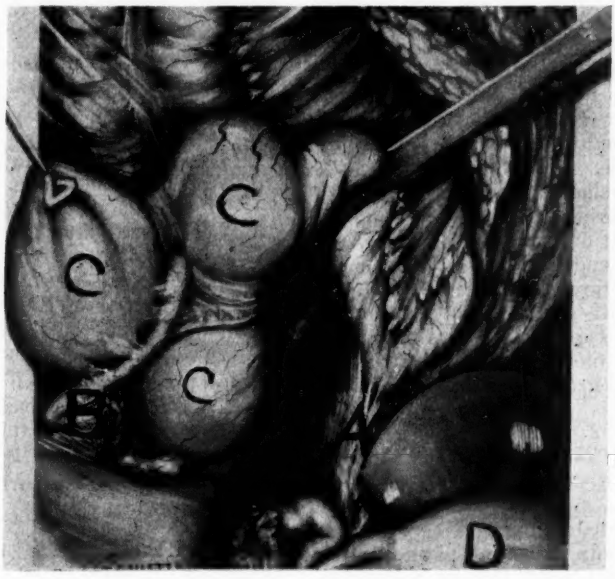

Fig. 7. Case XIII: M.O. *A*, ileopelvic band. *B*, diseased appendix. *C*, diverticulated cecum. *D*, uterus.

2. Large, redundant, dilated cecum.
3. Left ovary enlarged, cystic.
4. Strong band of adhesions from pelvic colon to left ovary, rotating colon downward.

Surgical procedure:

1. Adhesions relieved.
2. Cecum plicated.
3. Left ovary removed.

Result: Excellent.

CASE XIII. M.L.O.: 37; female; widow.
Operation: February 23, 1917.

Conditions found:

1. Fibroadenoma, right breast.

Surgical procedure:

1. Fibroadenoma of breast removed.
2. Divulsion and curettage.
3. Anterior colporrhaphy.
4. Perineorrhaphy.
5. Pelvic and abdominal adhesions relieved.
6. Right tube removed.
7. Ovarian cyst removed.
8. Suspension uterus.
9. Appendectomy.
10. Plication cecum.

Result: Uninterrupted recovery. Patient last seen July, 1939. Perfectly well during these 22 years.

CASE XIV. K.M.E.: 37; female; single.
Operation: February 7, 1917.
Conditions found:
1. Great omentum tightly adherent to abdominal wall, displacing transverse colon over ascending colon into right flank.
2. Large right ovarian cyst, size of six months' pregnancy, bound down by adhesions to posterior abdominal wall.
3. Uterus adherent to pelvic colon behind cyst.
4. Left ovary cystic, size of large orange, adherent to rectum.
5. Terminal coil of small bowel bound down by adhesions between pelvic wall and gut, and between gut and ovarian cyst, causing chronic intestinal obstruction with weeks of vomiting.

Surgical procedure:
1. Adhesions relieved.
2. Cyst of degenerated right ovary removed.
3. Diseased left ovary removed.
4. Uterus suspended in proper position.

Result: After stormy convalescence, including severe attack of gastric tetany, recovered perfect health; for past 22 years actively at work as Superintendent of Nurses of missionary hospital in Korea.

CASE XV. V.B.: 52; female; widow.
Operation: March 27, 1913.
Conditions found:
1. Lane's kink.
2. Mobile, rotated cecum.
3. Long appendix, which acted as ligament and restrained cecum from complete rotation.
4. Marked so-called Jackson's membrane.
5. Terminal ileum adherent to true pelvis.
6. Irremovable carcinoma of uterus, upper part of vagina, base of bladder, and encroaching on rectum.
7. Left ovary fibroid, adherent to sigmoid.

Surgical procedure:
1. Abdominal adhesions relieved.
2. Appendectomy.
3. Small omental graft placed over raw surfaces of ileum.
4. Ovaries, tubes, and pelvic glands from obturator foramina removed.
5. Starvation ligature and lymphatic block.

Note: Operation palliative. Pelvic malignancy complicated by intestinal pathology.

Result: Patient relieved of many distressing symptoms and lived nearly a year in comparative comfort.

CASE XVI. E.L.: 24; female; married.
Operation: May 7, 1915.
Conditions found:
1. Firm adhesions bound cecum and ileum to uterus and right ovary.
2. Ileal obstruction with distended duodenum.
3. Numerous uterine fibroids.
4. Right ovary cystic.

Surgical procedure:
1. Adhesions freed.
2. Appendectomy.
3. Uterus and right ovary removed.

Result: All symptoms, gastrointestinal and pelvic, relieved. Well for some years, then lost track of.

CASE XVII. W.B.: 49; female; single.
Operation: March 3, 1917.
Conditions found:
1. General enteroptosis.
2. Duodenum dilated to size of small wrist.
3. Appendix underhung, so placed as to shut off terminal ileum when patient was erect.
4. Cecal band attached to Fallopian tube with two cysts.
5. Bands across ascending colon to hepatic flexure almost causing obstruction of large bowel.
6. Accentuated last kink.

Surgical procedure:
1. All adhesions relieved.
2. Cysts of Fallopian tubes removed.
3. Appendectomy.

Result: From chronic invalidism to perfect health for many years; then lost track of.

CASE XVIII. G.L.H.: 58; female; single.
Operation: July 18, 1939.
Conditions found:
1. Appendix tied down by adhesions under terminal ileum, causing narrowing of outlet of small bowel with patient erect; contained fecal pus.
2. Ovaries atrophic.
3. Uterus atrophic; fibroid size of English walnut in fundus.
4. Gallbladder thickened; seat of chronic inflammation; no stones.
5. Strong band from fundus of gallbladder down to entrance of cystic duct into common bile duct. Band went across and indented duodenum; extended to transverse colon near hepatic flexure and suspended gut.

Surgical procedure:
1. Appendectomy.
2. Cholecystectomy.
3. Band removed; raw surfaces covered as far as possible.

Result: First postoperative week stormy. At present time, almost two months after operation, in excellent condition.

SUMMARY

From an experience of thousands of cases, a number of case histories are presented which confirm the author's thesis that pelvic pathology often is associated with abdominal pathology, and vice versa, and that the surgeon operating in one field must be prepared to deal adequately with conditions he may find in other fields, if he would expect satisfactory results to his patient. In other words, he should regard all pathologic conditions throughout the body as part of one pathologic picture and not as separate specialized entities to be dealt with individually by different specialists.

RÉSUMÉ

Rapport existant entre les conditions chirurgicales des viscères abdominaux et celles des viscères pelviens

L'auteur présente des cas qui confirment sa thèse que souvent les états pathologiques du bassin sont associés ou coexistent avec des états pathologiques abdominaux, et vice versa. Le chirurgien, pour obtenir les meilleurs résultats, doit corriger adéquatement les lésions des deux cavités. Toutes les manifestations pathologiques doivent être envisagées comme une seule entité et soignées si c'est possible simultanément. Ainsi sont obtenus les résultats les plus satisfaisants.

ZUSAMMENFASSUNG

Gegenseitige Beziehung zwischen chirurgischen Verhältnissen der Becken und Baucheingeweide: Bericht von aufschlussreichen Fällen

Aus der Erfahrung von tausenden Fällen wird eine Reihe von Krankengeschichten veröffentlicht, die die Ansicht des Verfassers, dass Erkrankungen des Beckeninhaltes oft mit Erkrankungen der Baucheingeweide und umgekehrt einhergehen bestätigen, daher muss der Chirurg, der in einer dieser Regionen operiert, und befriedigende Erfolge für seine Patienten erwartet, vorbereitet sein, auch Zustände in gleicher Weise zu behandeln, die er unter Umständen in einer anderen Region finden kann; in anderen Worten, er muss alle pathologischen Zustände in ganzen Körper als Teil eines gemeinsamen Krankheitsbildes betrachten und nicht als selbständige Zustände, die von verschiedenen Spezialisten individuel behandelt werden müssen.

SUMARIO

Interrelación de las Condiciones Quirúrgicas de la Pelvix y las Víceras Abdominales: Casos Ilustrativos

Por una experiencia de miles de casos, un número de historias clínicas las cuales confirman la tesis del autor que la patología de la pelvix es á menudo asociada con la patología abdominal, y vice versa, y que los cirujános operando en un campo deben de estar preparado adecuadamente para atacar condiciones que él pueda encontrar en otro campo quirúrgico, si él espera resultados satisfactorios para su enfermo. En otra palabra, él debe de considerar todas las condiciones patológicas á través del organismo como parte de un cuadro patológico y no como entidades separadas para ser atendidas con individualidad por especialidades distintas.

RIASSUNTO

Relazione delle condizioni chirurgiche dei visceri addominali e pelvici

L'autore sostine che gli stati pato-

logici pelvici sono spesso associati con stati patologici addominali. Tesi confermata dell'esperienza di una casuistica di miglioria di pazienti. Si che il chirurgo che opera in un campo, deve essere preparato ad ogni evenienza per condizioni patologiche in sede diversa. In altre parole, il chirurgo deve considerare le condizioni patologiche del malato come entità a se, e non come condizioni separate, da essere trattate da più specialisti.

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Pasteur Institute, Paris

Pasteur Institute of Paris, which has served as a model for practically every large experimental laboratory in the world, will soon enter upon its fifty-third year. Built by international public subscription, it was opened in 1888. Appropriate ceremonies marked its fiftieth anniversary, with President Albert Lebrun and a thousand scientists from all over the world in attendance to honor Pasteur and the work of the Institute.

Three Georgian-style buildings which contain 68 laboratories inhabited by 218 scientists comprise the Institute, which is situated near the Invalides, where Napoleon is entombed. Besides this there are many laboratory annexes throughout Paris, a large library, a hospital, a model monkey center for experimental studies, and a farm at Villeneuve-l'Etang, near Paris. The outstanding outgrowth of the Institute is the Curie Cancer Center which has 14 branches in Indo-China, North Africa, Greece, Persia, China and other places beyond the sea.

No single laboratory in the world has been responsible for so many bacteriological discoveries, largely directly applicable to preventive medicine, as the Pasteur Institute. Among its achievements, besides the well-known anti-rabies vaccine, are the preparation of a vaccine to prevent tuberculosis by Albert Calmette and Alphonse Guerin in 1921, Emile Roux's and Alexandre Yersin's epoch-making work on the diphtheria bacillus, the typhus discoveries of Charles Nicolle of the Pasteur Institute in Tunis, and the syphilis and encephalitis investigations of Constantin Levaditi.

Dr. Louis Martin is head of the entire organization. Three other famous scientists from among those who are quietly carrying on experiments for the benefit of mankind at the Institute are Dr. Ernest François Auguste Fourneau, Prof. Gaston Ramon, and Dr. Harry Plotz, the only American.

Dr. Fourneau is known for his development of stovaine and stovarsol, the names being derived from the English translation of "Fourneau," which is "stove."

Prof. Ramon lives surrounded by 400 horses at the Institute's annex in Garches. He makes quantities of serums against diphtheria, bubonic plague, tetanus and other diseases which are sold all over the world. He is famed as the man who developed diphtheria anti-toxin, and the principle of multiple vaccination, that is, immunization against several diseases with a single vaccination.

Dr. Plotz, who proved that measles is a virus disease, is now working on a measles serum; he recently developed a new modern type of smallpox vaccination.

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APPLICATIONS FOR ASSOCIATE MEMBERSHIP, MEMBERSHIP AND FELLOWSHIP IN THE INTERNATIONAL COLLEGE OF SURGEONS MAY BE ADDRESSED TO DR. CHARLES H. ARNOLD, 908 TERMINAL BUILDING, LINCOLN, NEBRASKA. THESE WILL BE ACTED UPON IN THE REGULAR ROUTINE AS OUTLINED IN THE BY-LAWS. APPLICATIONS FOR CONSIDERATION MUST BE RECEIVED NOT LATER THAN A MONTH PRECEDING THE REGULARLY STATED ASSEMBLY MEETING.

THE ETIOLOGY OF BILE PERITONITIS

KARL SCHLAEPFER, M.D.

MILWAUKEE

BILE peritonitis by definition is the presence of bile in the peritoneal cavity. It results from the mechanical rupture of an apparently normal bile duct or of the gall bladder. An unusual trauma is necessary for such an occurrence and the concomitant hemorrhage from the injured liver tissue dominates the clinical picture. In another group of instances a necrotizing cholangitis or cholecystitis brings about a circumscribed necrosis of the wall with perforation, usually at the site of an impacted gall stone, and an effusion of highly infected bile. The exudate is purulent and its biliary component is no longer recognizable. These observations are clinically well established and commonly are present with the diffuse purulent peritonitis.

In this communication, we are interested primarily in an intermediate group of cases in which clear or turbid bile is found in the peritoneal cavity. The bile content is striking. On first examination at operation or at necropsy, often no point of escape for the bile is detected so that the assumption has been made by Clairmont and von Haberer that permeation takes place through the intact gall bladder wall.

In the case reported by W. Smith from the Department of Pathology, Yale School of Medicine, and in fourteen other observations recorded in the literature, thorough gross and microscopic examination revealed the point of rupture to be either in the intrahepatic course of the biliary ducts or in the gall bladder.

In eighteen similar instances the point of rupture was not found at operation or necropsy. Observations made only at the time of operation are not conclusive if the point of rupture is not found. The methods for ascertaining the path of escape of bile are restricted, the available time being limited for the patient's sake. If the gall bladder is suspected, it can be examined more thoroughly after its operative removal. Cases in which only the operative examination was made are therefore not included in this report. The fifteen cases previously mentioned form the basis for the present discussion.

AGE AND SEX

Distribution as to age and sex is shown in the accompanying table:

POINT OF PERFORATION

	Intrahepatic Duct		*Gall Bladder Wall*	
Age	Male	Female	Male	Female
6½			1	
32			1	
48-50		4	1	
51-60		1	2	
61-70	1	1		1
71-80		1		
83		1		
Total	1	8	5	1

The average age is between 50 and 60. In the group of cases of ruptured intrahepatic duct the females predominate, whereas in the series of cases of perforation of the gall bladder, the majority are male.

A brief review of these very interesting observations is grouped according to the site of rupture. First, instances of a ruptured intrahepatic (subserous) duct will be discussed.

RUPTURE OF INTRAHEPATIC DUCT

Obstruction By Calculi. In this group belongs the observation already published by W. Smith in the *Annals of Surgery*. In the following abstract the gross and microscopic findings which pertain to the origin of the bile peritonitis are included:

CASE REPORT (Smith). A woman, 83 years of age, had repeated attacks of gall stone colic for a period of five years. She died with symptoms of acute intestinal obstruction, following an illness of three days' duration.

At necropsy 150 cc. of dark green bile were found in the peritoneal cavity. Streptococci were cultured from the exudate. The liver appeared small (1,100 Gm.) and was covered by a thin capsule. On the anterior surface, 7 mm. from the gall bladder fossa, a depressed area with a thickened capsule was noted. A small, green-stained papilla with a minute central opening revealed the place of rupture of a dilated subcapsular duct. The ampulla of Vater bulged for 3 cm. into the lumen of the duodenum which contained milky fluid. A stone occluded the ampulla and smaller stones were felt above it. The common duct measured 1.2 cm. in diameter. The wall was less than 1 mm. thick. Just below the entrance of the cystic duct, which was tortuous, a stone was found. The gall bladder was moderately dilated and embedded in fibrin. The wall was not greatly thickened.

The gall bladder contained one large and several smaller concretions of bile. The main branches of the hepatic duct were dilated and contained numerous small gall stones. One duct led to the depressed area mentioned above in the region of the ruptured subcapsular duct on the anterior surface of the liver. This depressed zone showed a layer of whitish fibrous tissue for a depth of 2 mm. The line of demarcation from the liver substance was sharp. The bile ducts, dilated to 1 mm. in diameter and recognized by their dark green stain, formed a plexus which communicated with the dilated branch of the hepatic duct already mentioned. On microscopic examination the central areas of the liver showed chronic cholangitis with marked increase in connective tissue; an acute inflammation predominated toward the surface. Leukocytes and masses of bacteria were noted in the lumen of the bile ducts, but no actual abscess was found. In the area of the ruptured bile duct, the wall separating the duct from the surface was edematous, necrotic, and partly bile stained. Laterally and toward the liver substance, the wall showed numerous polymorphonuclear cells and lymphocytes. The connective tissue separating this duct from the liver tissue contained many large and small bile ducts.

Summing up, this observation shows dilatation of a group of intrahepatic ducts resulting from intermittent obstruction of these ducts by calculi. An acute exacerbation of chronic cholangitis resulted in rupture of the dilated obstructed ducts in their subserous portion on the liver surface, with escape of infectious bile into the abdominal cavity.

Two observations of Nauwerk pertaining to the same type of bile peritonitis are of particular interest and may be herewith reviewed.

CASE 1 (Nauwerk). The patient, a woman 49 years of age, died of acute diffuse peritonitis. At necropsy 500 cc. of yellow brownish bile containing colon bacilli and Streptococci were obtained from the peritoneal cavity. On the liver surface near the juncture of the round and falciform ligaments, a slit-like opening was noted. The edges of this rent were bile stained and on compression of the gall bladder, bile escaped through this fissure. A stone occluded the common duct. The left hepatic duct and its branches were greatly dilated and showed chronic cholangitis. The small branches were irregularly dilated; the dilatation extended to the liver surface where thin-walled cysts, one of which had ruptured, were present.

CASE 2 (Nauwerk). The patient was a woman, 69 years old, who died of general peritonitis. At necropsy 500 cc. of brownish fluid were obtained, the culture of which revealed colon bacilli. The liver was enlarged, but the lateral and posterior portions of the left lobe were atrophic. In the vicinity of the falciform ligament, white dilated tortuous subserous ducts, with thin and fibrous walls, bulged over the surrounding tissue. Near the posterior border of the liver one of these dilated ducts showed a perforation the size of a pin point and had bile stained edges. On compression of the liver, turbid bile escaped through this narrow opening. Sections through the left lobe of the liver revealed numerous stones obstructing the intrahepatic ducts at several places. The common duct was also occluded by a stone impacted in the ampulla.

In 1909, Karrillon reported another interesting observation from Nauwerk's laboratory. A man, 66 years of age, died three days after a laparotomy had been performed for diffuse fibrinous peritonitis. At necropsy the common duct was found greatly dilated and occluded by a stone. At the edge of the left lobe of the liver several cystic dilated subserous bile ducts were noted, one of which had

ruptured. When the liver was compressed, bile escaped through the point of perforation. The wall around the opening showed diffuse round cell infiltration with increase in connective tissue.

Also in this case an obstruction within an intrahepatic duct superimposed upon an occlusion of the common duct had brought about an increasing dilatation of the bile ducts in the obstructed zone. This had extended finally to the subserous ducts, with rupture of one duct at the site of an acute necrotizing inflammation.

Vogel reported the case of a woman, 50 years old, with bile peritonitis due to rupture of a dilated subserous bile duct on the lower surface of the left lobe of the liver.

Ermer performed an autopsy on a 73 year old woman in whom 500 cc. of bile stained fluid were found in the peritoneal cavity. Hidden underneath shreds of fibrin within a groove of the right lobe of the liver a ruptured dilated subserous duct was found. The common duct was completely occluded by a stone.

Obstruction By New Growth. In the following cases new growths obstructed the bile ducts. Karrillon's patient, a woman 59 years of age, died from cancer of the gall bladder with metastases occluding the left hepatic duct. The surface of the left lobe of the liver showed numerous dilated subserous bile ducts, measuring 1 cm. in diameter, on the anterior and posterior surfaces. One of these dilated cystic ducts had ruptured. On compression of the liver lobe, turbid bile escaped through the point of rupture. Cancer nodules were scattered throughout the liver.

Ermer reported the case of a woman, 68 years old, whose abdominal cavity showed at necropsy a large amount of brownish green fluid mixed with fibrin. A cancerous growth occluded the common duct. In the "Schnürfurche" (sulcus) of the right lobe, 4 cm. from the gall bladder, a pin point opening was noted. Fluid injected in the hepatic duct escaped through this fistulous opening and contained numerous stones. Tumor metastases were found in the liver and in the regional lymph nodes.

Levin made a postmortem examination of a woman, 50 years of age, whose abdominal cavity contained 1,100 cc. of turbid yellowish fluid. Metastases from a pyloric cancer encircled the common duct, which was greatly dilated above the point of obstruction, measuring 2 cm. in diameter. The dilatation involved the hepatic ducts in their extra and intrahepatic courses. Between the diaphragm and the right lobe of the liver a pocket containing 2,000 cc. of bile stained fluid was opened. Two greatly dilated subserous ducts, each the size of a pencil, had ruptured into this subdiaphragmatic space. All the intrahepatic ducts of this area were greatly dilated. Microscopically, no evidence of cholangitis was found.

RUPTURE OF GALL BLADDER

Rupture of the gall bladder occurs at two places of predilection, namely: at the neck of the bladder and near the attachment of the bladder to the liver. When encountered at the neck, a diverticulum of Luschka which extends into the subserosa must be considered.

Nauwerk and Lübke (1913) published an observation in a man, 56 years old, who had a large amount of sterile bile in the peritoneal cavity. At necropsy the gall bladder showed adhesions to the duodenum and to the transverse colon. The gall bladder and the bile ducts were distended with water, but no fluid escaped. To the right of the round ligament a dilated subserous duct was found intact. Moderate dilatation of the common duct was the only finding of note. No remark was made about the condition of the hepatic ducts or possible calculi in the cystic or common ducts. Microscopically, a rupture was found in the wall of the gall bladder near its

attachment to the liver. The authors assumed rupture of the distended gall-bladder had been caused by mechanical force.

Sick and Fränkel observed a man, 32 years of age, who, while carrying a heavy bag up two flights of stairs, felt a sudden pain. Death followed. At autopsy a large amount of sterile bile was present in the peritoneal cavity. The gall bladder showed a pin point opening with edema of the muscular layer but absence of any inflammatory reaction in the wall. The authors assumed this perforation to be of a traumatic nature.

When making a postmorten examination of a man, 53 years old, Askanazy found in the peritoneal cavity a bile stained fluid mixed with fibrinopurulent exudate. At the neck of the gall bladder a distended duct of Luschka was occluded by numerous small calculi. Necrosis of the thinned wall had resulted in an escape of bile which was infected with colon bacilli.

At the exploratory laparotomy of a boy, 6 years of age, Risel found a large amount of sterile bile in the peritoneal cavity. The gall bladder was partly covered with fibrin. Microscopically a circumscribed necrosis of the wall was demonstrable.

Wagner found bile stained fluid in the peritoneal cavity of a man, 48 years old. The extrahepatic ducts were dilated and contained turbid bile. The gall bladder was covered with fibrin and contained numerous stones. On microscopic examination the gall bladder wall showed a small circumscribed area of necrosis.

At the exploratory laparotomy of a woman, 62 years old, Louros found 1500 cc. of bile in the abdominal cavity. Bile was dribbling from the gall bladder. At its neck the extirpated gall bladder showed an ulcer which extended into the muscularis. Microscopically a circumscribed necrosis of the whole wall was found, and two fissures passed in an oblique direction through this area of necrosis.

Several similar observations are not included in the above survey because the rupture in the gall bladder which was suspected at operation was not demonstrable. Concern for the patient restricted the time for the examination during operation in the cases of Schievelbein, Wolff, Madlener, Leriche, Finsterer, and Sölling, in two cases of Doberauer and in five of Hugel. In all these observations, the point of perforation was not found. Burkhardt, Clairmont, Riedel, and Johansson encountered similar difficulties in their observations.

COMMENT

Out of the whole group of bile peritonitis cases, a relatively small number in which the escape of bile occurs from a ruptured subserous bile duct on the liver surface or through the gall bladder wall deserves special attention. The biliary character of the exudate is striking, contrary to many observations in which an abscess of the gall bladder or of the common duct breaks into the peritoneal cavity and produces a purulent perforative peritonitis. In the cases under discussion only very careful anatomical studies enabled the reporters to find the point of rupture. Many observers, not finding a microscopic perforation, assumed that the intact gall bladder wall was permeable for bile.

Clairmont and von Haberer, in 1910, put forth this explanation and were supported by Wolff and König. They based their statements on clinical observations and examination at operation. The opponents (Nauwerk, Louros, Askanazy, Smith), confirmed their view by thorough gross and microscopic studies of specimens obtained at necropsy. The point of escape for the bile, usually being minute, is often ascertained only by serial sections through the area of suspected rupture.

From the study of the above cases of ruptured subserous ducts, one fact stands out: Dilatation could be traced from the point of rupture on the surface of the

liver through the liver to the hilum. In two instances (Smith, Nauwerk) concretions were found within the intrahepatic ducts, and an impacted stone (or a new growth) occluded the common duct in the illness that proved fatal.

In every instance a thorough examination of the dilated bile ducts for possible concretions would undoubtedly widen the scope of evidence. Some of these calculi may escape through the point of rupture into the peritoneal cavity and can be recovered only from the fluid.

EXPERIMENTAL STUDIES

In experiments performed on rabbits, partial occlusion of the common duct was combined with ligation of the cystic duct, thus eliminating the gall bladder. These experiments, which were intended to illustrate the effect of an obstruction in the common duct on the intrahepatic ducts, can be summarized as follows: Great dilatation of the extrahepatic ducts resulted, and in a few instances even the larger branches of the intrahepatic ducts enlarged for a short distance. In no observation did the dilatation extend into the smaller branches of the hepatic ducts or become visible on the surface of the liver. Unfortunately, as all the animals died from rapid emaciation within four weeks, the duration of the experiments was greatly limited.

Repeated attempts to produce partial occlusion of one hepatic duct in rabbits failed, either because the animals did not stand the operation or because a pressure necrosis resulted at the site of the occlusion. In one instance in which a calculus resulting from an injection of HCl into the gall bladder blocked one hepatic duct, a cystic dilatation of all the hepatic branches of this duct was observed. This liver lobe had an irregular nodular appearance. The other lobes were normal. This one experiment points to an obstruction within the intrahepatic duct as essential for the dilatation of the branches draining into the one duct.

ETIOLOGY

Rupture of a dilated subserous bile duct in cases in which no infection of the bile is present is explained by suddenly increased intra-abdominal pressure. These instances are extremely rare. They are not included in our survey since the point of escape was not ascertained.

In all observations herein reported we were dealing with chronic cholangitis, and for these cases the explanation given by Nauwerk seems the most plausible, although it has not been confirmed experimentally. According to Nauwerk, chronic obstruction of the biliary duct causes stasis of the bile and dilatation of the corresponding bile ducts. Increasing dilatation interferes with the vascular supply to the wall and finally results in local necrosis, especially when bacterial toxins mix with the inflammatory exudate. Under the effect of a sudden elevation of the intra-abdominal pressure, a rupture of the dilated duct occurs through the capsule of Glisson, and the bile escapes into the peritoneal cavity.

In the observations with rupture of the gall bladder, some shreds of fibrin on the serous surface of the gall bladder were the only findings on gross examination. Only serial sections brought evidence of a leak in the wall at the site of a circumscribed necrotizing cholecystitis.

Rupture of the extrahepatic ducts is always the result of a pressure necrosis by a calculus in the presence of acute purulent cholangitis. The bile character in the exudate is no longer recognizable.

Experimentally we produced dilatation of the extrahepatic ducts on rabbits and dogs by occlusion of the common duct in its lowest portion; in all instances escape of bile was due to a pressure necrosis at the place where the rubber band had been placed around the duct.

SUMMARY

Escape of clear or turbid bile into the peritoneal cavity may result from rup-

ture of a dilated subserous bile duct or of the gall bladder.

The rupture of a subserous bile duct is the end result of intermittent or continuous partial occlusion of an intrahepatic duct by calculi with concomitant chronic cholangitis. A neoplastic growth may have the same effect. In all these instances an additional obstruction is found in the common duct. This may easily distract the attention from the main etiologic factor mentioned above as responsible for the dilatation of the smaller bile ducts up to the surface of the liver.

Rupture of the gall bladder occurs either in the fundus region near its attachment to the liver or in the neck region. In the second instance, a ruptured diverticulum of Luschka must be thought of as a causative factor. Chronic cholecystitis with an acute exacerbation is responsible for the circumscribed necrosis which leads to perforation.

Rupture of an extrahepatic bile duct is always the result of a pressure necrosis due to an impacted gall stone in the presence of an acute phlegmonous cholangitis.

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RÉSUMÉ

L'étiologie de la péritonite biliaire

Le déversement de bile claire ou turbide dans la cavité peritonéale peut résulter d'une rupture sous-séreuse d'un conduit biliaire ou de la vésicule biliaire.

La rupture d'un conduit biliaire sous-séreux résulte souvent d'une occlusion intermittente ou continue (partielle) d'un conduit biliaire par calculs accompagnés de cholangite chronique, un neoplasme peut être le facteur causatif. Dans tous ces cas, on trouve une obstruction (partielle ou complète) du choledoque. On trouve aussi un dilatation des petits conduits biliaires sur la surface du foie. Les ruptures de la vésicule biliaire surviennent ou dans la région du fond de la vésicule près de son attachement au foie ou au col de la vessie. Il ne faut pas meconnaître une rupture du diverticule de Luschka. Une inflammation chronique avec poussée aiguë peut entraîner une nécrose locale circonscrite déterminant une perforation. La rupture d'un conduit biliaire extra-hépatique resulte toujours d'une nécrose due à un calcul enclavé et associée à une cholangite phlegmoneuse aiguë.

ZUSAMMENFASSUNG

Die Etiologie der Gallen-Peritonitis

Das Entweichen von klarer oder trüber Gallenflüssigkeit in die Bauchhöhle kann von Platzen eines subserosen Gallenganges oder der Gallenblase herrühren.

Das Platzen eines subserosen Gallengangs ist das Ergebnis eines intermittierenden oder dauernden Verschlusses eines intrahepatischen Ganges durch Steine mit begleitender chronischer Cholangitis. Ein neoplastischer Tumor kann dieselbe Wirkung hervorrufen. In all diesen Fällen findet man zusätzlich einen Verschluss des Ductus Choledochus. Dies vermag leicht die Aufmerksamkeit von dem hauptsächlichen, oben erwähnten ursächlichen Faktor abzulenken welcher für die Erweiterung der kleinen Gallengänge bis zur Fläche der Leber verantwortlich ist.

Platzen der Gallenblase geschieht entweder in der Fundusgegend nahe ihrer Befestigung an der Leber oder in der Halsgegend. In zweiter Hinsicht muss ein geplatzter Luschka'scher Divertikel als ursächlicher Faktor angesehen werden. Eine chronische Gallenblasen Entzündung mit einer akuten Verschlimmerung ist verantwortlich für die umschriebene Nekrose, welche zur Perforation führt.

Ruptur eines Gallengangs ausserhalb der Leber ist immer das Ergebnis einer Darmnekrose veranlasst durch einen eingekeilten Gallenstein in Anwesenheit einer akuten phlegmonischen Gallengangentzündung.

SUMARIO

La Etiologia de Peritonitis Biliar

El escape de bilis clara ó turbidad dentro de la cavidad peritoneal puede

resultar por la rotura de un conducto biliar subseroso dilatado ó de la vesícula biliar.

La rotura del conducto biliar subseroso es el resultado final de la oclusión continua ó intermitente de un conducto intrahepático por un calculo con colangitis cronica concomitante. Un crecimiento neoplasico puede tener los mismos resultados. En todas éstas condicines una obstrución adicional es encontrada en el conducto común. Esto puede facilmente detractar la atención del factor etiológico principal mencionado arriba como responsable por la dilatación de los conductos biliares mas pequeños extendidos hasta la superficie del hígado.

Rotura de la vesícula biliar ocurre en la region del fondo proximo á la inserción del hígado ó en la region del cuello. En el caso segundo, una rotura del diverticulum de Luschka debe de pensarse como el factor causante. Una colecistitis crónica con una exacerbación aguda es responsable por la necrosis circunscrita que la lleva á la perforación.

Rotura de un conducto biliar extrahepatico es siempre el resultado de necrosis por presión debido á una piedra infartada en la presencia de una colangitis flemonosa aguda.

RIASSUNTO

L'Etiologia della peritonite biliare

La fuoriscita di bile nella cavità peritoneale può risultare o dalla rottura di un dotto biliare subseroso, dilatato, or della cistifillea.

La rottura del dotto biliare subseroso è il risultato finale di una occlusione intermittente o continua del dotto intraepatico, per calcolo, con concomitante colangite cronica. Un neoplasma può avere lo stesso effetto. In tutte queste circostanze, un' obstruzione del dotto comune è presente e ciò può distracci dal sopramenzionato e primario fattore etiologico, come responsible per la dilatazione dei picoli dotti biliari alla superfice del fegato.

La rottura della cistifillea può avvenire o nella regione del fondo, o in quella del collo. In quest' ultimo caso, la rottura del diverticolo di Luschka può essere considerato come il fattore causale.

Una colecistite cronica con esacerbazione acute è responsabile per la necrosi circoscritto che tende alla perforazione.

La rottura del dotto biliare extraepatico è sempre il risultato di una necrosi da pressione, dovuta a un calcolo, in presenza di una colangite acuta flemmonosa.

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TO OUR MEMBERS

Technical exhibitors need concrete evidence of your personal interest in their exhibits. Please register at their booths in order to demonstrate that it pays to exhibit at the Annual Meeting of the International College of Surgeons. Our income from these exhibits pays a part of the cost of our Annual Meeting. Aside from this, you yourself will benefit from visiting each of them.

THE ARRANGEMENT COMMITTEE

SOME OLD AUTHORS AND SOME OLD BOOKS

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"In the magic pages of books there is found all that mankind has thought, done, gained and been." These words were used by Thomas Carlyle 100 years ago in expressing his opinion of books.

From the exalted opinion expressed by Carlyle, it is easy to understand why man for centuries has been and still is deeply absorbed in writing as well as in studying books. On the other hand, how widely mankind has profited by the study of books is not only beyond comprehension, but is even beyond the imagination of the human mind.

LIBRARIES

As a result of his interest and study, man has created throughout the centuries and in all lands some of the most beneficient and informative of all institutions—the great libraries.

American Libraries. Today there are in America alone more than 10,000 libraries with 1,000 or more volumes on file. Of the great libraries of the world, the Congressional, in Washington, D. C., is now claimed to be the largest. It has on file over 8,000,000 printed books, maps, prints and other volumes. The development of the college library in America is positively amazing. The first college library was established at Harvard College with 330 volumes 300 years ago. This library, the largest university library in America, now has 3,945,318 volumes. The number of books in American colleges now totals 62,858,078.

Early Egyptian Library. Of the famous libraries of antiquity, the most renowned was the Alexandrian, developed by Ptolemy the Second, or Ptolemy Philadelphius, about 260 B. C. In it there were on file more than 700,000 "Rolls." At its height it was the single repository of the culture of the ancient world. It is believed that pagan civilization could be almost completely reconstructed, if the records of this institution were available today. The library existed for almost a thousand years. Its destruction in 640 A.D. is regarded as one of the great tragedies of history. The hundreds of thousands of rolls on file were distributed as fuel over a period of six months to the public baths of the city.

Early Medical Library. Geographically, it might be of interest to mention that only a short distance from Alexandria, along the Ionian Coast of Asia Minor, a small peninsula juts out into the Aegean Sea. In the pre-Christian era there was located on this peninsula a celebrated university with a medical school of wide reputation. In this famous institution there was established a library with a section devoted exclusively to books dealing with medicine. This, probably, may be regarded as one of the earliest medical school libraries.

From a study of ancient history, it becomes at once apparent, I think, that the Ionian Coast of Asia Minor with some of the small islands in the Aegean Sea close by was really the birth place of the science and art of medicine.

COLLECTING MEDICAL BOOKS

From records available, it is evident that there always has been a widespread interest in the collection of books, and this is probably greater today than ever before.

Many years ago I began, in a small way, the collection of old medical books. In a comparatively short time I managed to gather a few hundred volumes. Nearly all of these I presented to our college

library*, and there were, among the number, two volumes which I considered almost priceless. These were textbooks on anatomy. One was compiled by Nathaniel Highmore (1613-1684), the celebrated English anatomist of Antrum of Highmore fame, in 1651, and the other, in 1627, by the noted Dutch anatomist, Adrian van Spieghel or Spigelius (1578-1625), whose name is associated with the Spigelian lobe of the liver.

My interest in "collecting" was revived about 15 years ago, and I now have on file more than 2,000 volumes, combining, probably, one of the most complete private collections of works on obstetrics and gynecology in this section of our country.

Historical sketches of some of the outstanding physicians with whose biographies I have become acquainted in the pursuit of this hobby are herein presented.

OLDEST MEDICAL WRITERS

Hippocrates. A short distance off the coast of the Cnidian Peninsula is the little Island of Cos. This is about the size of the Isle of Wight in the English Channel. It is about 95 square miles in area, corresponding to the size of Washington, D. C. Here there occurred one of the most important incidents in all medical history, the birth of *Hippocrates.* Incidentally, it was here, also, that Ptolemy Philadelphius was born in 311 B.C.

The birth of Hippocrates took place in 460 B.C., only a few short years after some of the most momentous episodes in ancient history, including the decisive defeat of Darius on the Plain of Marathon (490 B.C.). It was also only ten years after the Persians were completely destroyed in the naval battle of Salamis (480 B.C.).

This period was noted as the Golden Age of Greece. It was the age of Sophocles, Aeschylus, Pericles, Herodotus, Plato, Socrates, Phidias and a host of others.

Hippocrates received his preliminary education (I suppose one should designate it premedical education) at Selymbria, near the present site of Constantinople (Istanbul) and his medical education in the School at Cnidus.

Of the medical works of antiquity, those of Hippocrates are probably not only the best, but the most widely known. His little book of "Aphorisms" is one of the great classics of all literature, and the first sentence takes first rank with those most frequently quoted today, namely: "Life is short, art long, occasion fugitive, experience delusive and judgment difficult." Like Galen, living 600 years later, Hippocrates was one of the most prolific writers of the pre-Christian era.

In his medical works there is found for the first time a description of the methods employed in collecting clinical records, as well as the technic of bedside study (I was almost tempted to say "the bedside manner"). Hippocrates may be regarded and, indeed, is not infrequently referred to as the Sydenham of ancient medicine. The works of Hippocrates cover almost every conceivable aspect of medicine and surgery. In some respects his methods of study and treatment compare favorably with those practised today.

Papyrus Ebers. However, the oldest, largest, most complete and most perfect medical book extant which antedates Hippocrates by more than 1,200 years, is "The Papyrus Ebers." This "book" was found with the "Edward Smith Papyrus" in a metallic case between the thighs of a mummy near Thebes and was obtained in 1872 by the noted German Egyptologist, George Ebers. It is now one of the most precious treasures of the University of Leipzig, Germany. The Edward Smith Papyrus is in the

* Jefferson Medical College of Philadelphia.

Library of the New York Historical Society.

"The Papyrus Ebers" was written, it is believed, about 1600 B.C., and covers Egyptian medicine for the preceding 1500 years.

Galen. In studying the shore line of the Aegean Sea, it is interesting to observe that only a short distance north of Cnidus was located the City of Ephesus. In the second century A.D., about the year 130, there was born in the City of Pergamus, a few miles north of Ephesus and near the ancient city of Troy, a baby who became the dominating figure in world medicine for nearly 1500 years, Galen Claudius.

Galen was one of the most voluminous writers of the ancient world. He composed, it is stated, more than 500 treatises on various topiçs, including not only medicine, but grammar, logic and ethics. He was a strong advocate of a high ethical standard, but a weakling in its practice. Even after a lapse of 1800 years this is a human frailty occasionally observed today. For instance, while residing in Rome during the reign of Marcus Aurelius in 168 A.D., Galen proclaimed himself, because of his learning and more especially because of his success as a physician, a "Paradoxologus" (wonder speaker) and a "Paradoxopoeus" (wonder worker). Naturally, because of this egotistical attitude he incurred the bitter enmity of his fellow practitioners.

Soranus. It was also in the second century A.D. that a noted Ephesian, Soranus, compiled one of the greatest works on obstetrics, gynecology and pediatrics. This was the standard work on these subjects, especially obstetrics and gynecology, for more than 1400 years. He also composed the earliest biography of Hippocrates.

FRENCH AND ITALIAN SCHOOLS

Paré. Although there were published plagiarized volumes of Soranus, both with respect to text and illustrations, notably one in German by Eucharius Rósslin, of Worms, in 1513, called the "Rosegarten," written especially for midwives, and another by Thomas Raynalde, of England, written in 1545, entitled the "Byrthe of Mankynde," there was nothing of real obstetric merit presented until the publication, in 1850, of the work of the famous French army surgeon, *Ambroise Paré* (1510-1590).

Paré, acting, no doubt, on the suggestion of Soranus, revived the operation of podalic version. It was Paré, also, who restored the ligature and published essays of a practical nature on various aspects of surgery. His greatest work, of course, was his textbook on Surgery, presented in 1564. It was Paré, Garrison has said, "who made amputation modern by reintroducing the ligation of blood vessels."

Vesalius. Contemporary with Paré in Paris, a young man was studying in the University of Padua, Italy. He was born of German parentage in Brussels, Belgium, and received his early education in the University of Louvain. This young man, who was destined to become the greatest figure in the world of medicine "after Galen and before Harvey," was *Andreas Vesalius* (1514-1564).

Previously, for more than 1400 years, Galen was the dominant personality of all phases of medicine, including anatomy, but with the publication in 1543 of the "Fabrica Humani Corporis," by Vesalius, there was given to the world anatomy, as expressed by Garrison, "in the form of a living, working science."

A copy of the "Fabrica," illustrated by Jan Kalkar, a pupil of Titian, is one of the treasures of our college library.

Shortly after the publication of this great work, Vesalius was succeeded as head of the Department of Anatomy, in Padua, by an authority almost equally as eminent, Gabriele Falloppio (1523-1562).

FAMOUS ENGLISH WRITER

Thirty-five years after the appearance of the work of Vesalius, there was born on the Kentish Coast of England, at Folkstone, a baby boy who 197 years prior to the foundation of the Jefferson Medical College gave to the world the first description of the circulation of the blood (1628). This made *William Harvey* (1578-1657) the most distinguished physician of the seventeeth century and probably the greatest English physician in all history.

Harvey's discovery was regarded as the most momentous contribution to medicine since the time of Galen, 1500 years before. William Harvey died in 1657, at the age of seventy-nine, twenty-nine years after the publication of his discovery.

Harvey was not only devoted to medical science, but he was, likewise, always deeply interested in the welfare of his neighbors, especially the poor of his native town, and to these he generously bequeathed a large part of his estate, typifying the ideal gentleman of old England. Here it might be of interest to mention, also, that in 1628, William Harvey delivered the Lumleian Lecture at the annual meeting of the Royal College of Physicians, in London. Two hundred and ninety-six years later (April 3, 1924), this lecture was delivered by the late and universally beloved head of the Department of Medicine in our Institution, Doctor Thomas McCrae.

ARABIAN AND TURKISH WRITERS

Before continuing my remarks in a chronological way, may I beg your indulgence while I refer briefly to two noted authors of the tenth and eleventh centuries, one an Arab, the other a Turk.

Rhazes. The first, *Rhazes* (860-932), was the directing head, though not the founder, as is sometimes claimed, of the celebrated hospital in the City of Bagdad, once the proudest, largest and richest city in the old world, the city of "Sindbad the Sailor," "Aladdin and The Wonderful Lamp," "Ali Baba and the Forty Thieves" and the other "Thousand and One Arabian Nights."

As a clinical portrayer of disease, Rhazes is said to rank with Hippocrates and Sydenham. His description of smallpox and measles, the first authentic account of these diseases, will forever be included among the classics of medicine.

The clinical portrait he drew of smallpox and measles is so clear and complete as to resemble a description of these disorders as found in the modern textbooks of today. Rhazes also compiled an encyclopedia of medicine, called "El Hawi" or "Continens." This is a large work of 546 two column pages, measuring eighteen inches in length and twelve inches in width.

A Latin edition of this book, which I am fortunate enough to possess, is a masterpiece of typographical art and was printed in Venice in 1506. It was rebacked with a copy of the original binding some time in the eighteenth century. The preface states, "The work covers the whole science and art of medicine in twenty-five books."

Avicenna. Rhazes was succeeded many years later (about 100) in Bagdad by the "Prince of Physicians," *Avicenna* or, in Turkish, *Ibni Sina.* He was born in Buhara in 980 A.D., of Turkish and not Persian parentage, as formerly taught. A study recently conducted by the University of Istanbul would seem to prove conclusively the Turkish origin of this outstanding figure in medical history.

Avicenna was noted not only for his encyclopedic contribution to medicine, his "Canon," a huge volume of 610 pages, but, also, for his contributions to numerous other topics, more than 100 in all. He has even been called the "Father of Geology," because of his remarkable description of the origin of mountains.

Avicenna was, moreover, a poet of distinction, writing quatrains in the style of the great Persian poet, Omar Khayyám, famous for his "Rubáiyát."

The 1593 edition of Avicenna in Arabic, the rarest of all editions of this great work, is also in my collection. In this there is found among many other things of importance a description of diabetes and the sweetish taste of diabetic urine.

I think it is of some importance to know that in 1395 the works of Rhazes and Avicenna composed, with seven others, the entire library of the medical faculty of Paris.

Other Arabians. There were besides Rhazes and Avicenna many other physicians of Arabian origin, including *Haly ben Abbas* and *Avenzoar* of Seville; and *Moses Maimonides, Averroes* and the noted surgeon, *Albucasis,* all of Cordova.

SOME ENGLISH PHYSICIANS

Thus far I have devoted my remarks to only a few old authors and a few old books. The names of those mentioned are immortal. Forever they will remain as luminous characters in medical history. They have thrown "the torch" and of all the ancient writers it is to them, more than any other, we owe our heritage.

Teachers of Early Americans. May I now refer to a period of special historical interest to medicine in Philadelphia, the period from 1750 to 1800. During this time there flourished in England a number of physicians of world-wide distinction. These were the medical mentors of the youth of Colonial America and, especially, the youth of our Philadelphia. Included among their students from Philadelphia were William Shippen, Jr. (1736-1808) and John Morgan (1735-89), the first *professors* of anatomy, surgery, obstetrics and medicine in our country; and founders, in 1765, of the Medical School of the University of Pennsylvania.

The group of English physicians I have in mind were generously helpful to the students in this country, even though at the time there was looming on the horizon a foreboding discontent. Comprising the group were men of varied temperament and character, though they were all most hospitable and charitable.

I should like to refer to four and it is to these chiefly that Colonial America owed its medical creation. The most renowned members of this little group were the *Hunters, William* (1718-83) and *John* (1728-93). The first was famous for his surpassing anatomical knowledge, and among many other things for his classical work on the "Anatomy of the Pregnant Uterus."

The second I include in this distinguished coterie, first, because of his devotion to natural history, second, because of his contribution to surgical pathology and surgery in general, third, because of his founding of the great Hunterian Museum in the Royal Society of Surgery, London, and fourth, because of the encouragement he gave to Edward Jenner in his studies which ultimately led to the discovery of vaccination.

Jenner on one occasion in a letter to John Hunter stated that he was thinking over the problem of vaccination very seriously. Hunter replied, "Don't think, act."

Another member of the group was the noted Quaker physician, *John Fothergill* (1712-80), (not Fathergill). He was an intimate of Benjamin Franklin and a devoted friend of the little Quaker Colony in Philadelphia.

It was Fothergill who presented to the Pennsylvania Hospital some of its most treasured possessions, the collection of anatomic and obstetric charts and casts. These were the first to be used for teaching purposes in our country. They

were conveyed to the hospital by William Shippen, Jr. on his return from Europe in 1762, seven years after the hospital was founded. The charts were prepared by the noted artist, Van Rymsdyk. It was he who also illustrated William Hunter's "Anatomy of the Pregnant Uterus."

The fourth member was that famous and versatile Quaker doctor, *John Coakley Lettsom* (1744-1815). He, it has been said, was one of the first Englishmen to learn how to live on twenty-four hours a day. He was a tireless practitioner, a noted humanitarian and a constant contributor to literature, both medical and lay. To him, probably erroneously, is ascribed the oft-repeated verse:

> When any sick to me apply,
> I physics, bleeds, and sweats 'em;
> If after that they choose to die,
> What's that to me,
> I Lettsom.

Doctor Lettsom also was an intimate friend of Benjamin Franklin, of the Quakers in Philadelphia, and of the medical students from the colonies.

There is still another conspicuous figure in English medicine whom America, and indeed, all the world should revere. As Vesalius will forever remain the outstanding figure in anatomy of the sixteenth, so will *Henry Gray* forever remain as the greatest writer on anatomy of the nineteenth century.

Two years after the founding of our college, in 1825, Henry Gray was born in London. He was graduated from St. George's Hospital and was connected with that institution throughout his life, a life all too short.

While still a student he was awarded, in 1848, the triennial prize of the Royal College of Surgeons for an essay entitled: "The Origin, Connections and Distribution of the Nerves to the Human Eye and Its Appendages, Illustrated by Comparative Dissections of the Eye in Other Vertebrate Animals."

He became a member of the Royal Society at the age of twenty-five. In the following year he was awarded the Astley Cooper prize for a dissertation: "On the Structure and Use of the Spleen."

Five years later, in 1858, he published his famous textbook of anatomy, a work of 750 pages with an illustration for almost every day in the year, 363 to be exact.

While attending a nephew suffering with smallpox, Henry Gray contracted the disease in confluent form and died in 1861 at the age of thirty-four.

OUTSTANDING BRITISH PHYSICIANS

Finally, there are four other physicians of Great Britain to whom I wish to make brief reference. Two of these were English, one was Scotch and the other was born of English parents in Ireland—a group of cosmopolitans.

Browne. The first, *Sir Thomas Browne* (1605-82), is deserving of special mention, because of the grandeur of his ideas, because of his unbounded charity and because of his incomparable literary contributions. He was an author who, it has been said, combined the wit of Montaigne with the learning of Erasmus.

He was born in London in 1605 and graduated Bachelor of Arts in Oxford, in 1626. He studied in the Universities of Montpellier, France and Padua, Italy, but took his doctor's degree at the University of Leyden. He practised his profession in Norwich, England, and during that time made his notable gifts to literature.

He compiled numerous works, but his fame rests chiefly on four: first, "Pseudodoxia Epidemica" or "Enquiries into Very Many Received Tenets and Commonly Presumed Truths;" second, "Hydriotaphia" or "Urn Burial;" third, "The Garden of Cyrus," and fourth, the best known of all, especially to the

physician, "Religio Medici," published about 1635.

May I quote a few short sentences from the "Religio." Could any passages be more lofty, more beautiful?

> a. At my devotion I love to use the civility of my knees.
>
> b. At the sight of a cross or a crucifix I can dispense with my hat, but scarce with the thought or memory of my Saviour.
>
> c. There are two books from whence I collect my divinity: Besides that written one of God, another of His Servant, Nature, that universal and public manuscript, that lies expansed to the eyes of all.

"Religio Medici," as you probably know, was a very beloved member of the bedside library of the late Sir William Osler, and it has been of mine for more than thirty years. Doctor Osler's little volume accompanied him in death and to his grave.

Sir Thomas Browne died at his home in Norwich, in 1682, on his seventy-seventh birthday, with the knowledge that his "Religio" was translated into French, German and other languages.

Brown. The second member of this group, *John Brown* (1810-1882), hailed from the highlands of Scotland. We shall forever be indebted to him for his two little volumes, "Spare Hours." In these there are found that interesting contribution everyone should read, entitled: "With Brains, Sir."

In "Spare Hours" there is, besides, the great essay on John Locke and Thomas Sydenham, "the one the founder of our analytical philosophy of mind and the other of our practical medicine."

In "Spare Hours" is, also, the immortal story of "Rab and His Friends." In this there is portrayed not only one of the most impressive clinical descriptions of cancer of the breast, but, also, one of the most pathetic tales in all literature.

John Brown graduated in medicine at the University of Edinburgh, in 1833. He was a born writer and was always emphatic in teaching that "an author should publish nothing unless he had something to say and is sure to say it aright."

It is altogether likely that "Rab and His Friends" was written when John Brown was still a student clerk in the Minto House Hospital, Edinburgh. It was here the patient whom he tenderly describes as Ailie Noble came under his care. In examining the patient he records: "What could I say? There it was, that had once been so soft, so shapely, so white, so gracious and bountiful, so 'full of all blessed conditions,' hard as a stone, a centre of horrid pain, making that pale face with its gray, lucid, reasonable eyes, and its sweet resolved mouth, express the full measure of suffering overcome."

I have on many occasions heard my beloved teacher and hospital chief, the late Doctor J. Chalmers Da Costa, reverently refer to dear old Doctor John Brown.

Doctor Brown served his apprenticeship under Mr. James Syme, one of the most competent surgeons Scotland ever produced. Syme was the father-in-law of one of the greatest benefactors of mankind, Joseph Lister. Doctor Brown writes that Syme excelled in everything, save penmanship, and even this, he said, had every fine quality, "except legibility."

Goldsmith. I have included the Irish physician not because of any special contribution he made to medicine. There is even some doubt as to whether he ever received a medical degree, but he undoubtedly did spend some time in the study of medicine in the Universities of Edinburgh, Leyden and perhaps Padua.

I refer to him, particularly, because it was Doctor Oliver Goldsmith (1728-1774) who added to our literature "The Good Natured Man," "She Stoops To Conquer," "The Traveller," "The Vicar of Wakefield," and "The Deserted Village," contributions that can never die.

To me he was one of the most lovable, yet one of the most pathetic characters

in all literature. In his youth he was strictly a "play boy," heedless of opportunity and spending most of his early life on the Continent as a flute player, an itinerant musician.

Although his veracity was of a questionable nature, he was, at the same time, most gullible and trusting. In writing his history of Greece, for example, he was almost tricked to include an account of a frightful battle between the armies of Alexander the Great and Montezuma.

It was in the "Traveller," "The Deserted Village" and "The Vicar of Wakefield" that Oliver Goldsmith taught us, as exemplified by his father, dear old Doctor Primrose, how to "learn the luxury of doing good."

It was the Vicar who also said, "I was ever of the opinion that the honest man who married and brought up a large family did more service than he who continued single and only talked of population."

Who among us can ever forget the lines of the Ballad in the "Vicar of Wakefield," reading:

> Then, pilgrim, turn, thy cares forego;
> All earth-born cares are wrong;
> Man wants but little here below,
> Nor wants that little long.

To his friend, Sir Joshua Reynolds, he dedicated "The Deserted Village," and "She Stoops To Conquer," to Samuel Johnson. "The Traveller" was dedicated to his brother, Henry.

Oliver Goldsmith was born in Ireland, on November 10, 1728, ninety-seven years before the founding of our medical school. He died, probably from an overdose of an opium preparation prescribed by himself, in London on the fourth of April, 1774, in his forty-sixth year. He was buried in the Temple Church Yard and I have, on a few occasions, stood in reverence at the site which is supposed to mark his last resting place.

Among those who "followed his coffin" was Edmund Burke, who, as expressed by Pope, was a man "too proud of the right to pursue the expedient," Sir Joshua Reynolds and, no doubt, Doctor Samuel Johnson, with his noted biographer, James Boswell.

Keats. Finally, the last member of this little group, born thirty years before our college was opened and presenting to the world at the age of eighteen some of the sweetest lyrics ever to flow from the pen of man, is *John Keats* (1795-1821).

After studying medicine at St. Thomas' and Guy's Hospitals, he qualified as a physician, it is recorded, at the age of twenty. He died in Rome in 1821 of tuberculosis, probably contracted from his brother, Tom, and is buried in the Protestant Cemetery in that city. His epitaph, written by himself, reads: "Here lies one whose name is writ in water." Thirty-two years ago this month I stood in homage with many other pilgrims beside his grave.

Literature was a part of this youth's birth. It was the main part. Among his intimate friends were Leigh Hunt, of "Abou Ben Adhem" fame and Shelley, world renowned for his masterpiece: "Prometheus Unbound." Keats's first book of poems, published in 1818, was dedicated to Leigh Hunt.

At the age of 23, only three years before his death, John Keats bequeathed to the world "Endymion." The first line of this literary classic is probably more midely known and more frequently quoted than any other in the English language: "A thing of beauty is a joy forever."

SUMMARY

Details concerning some of the outstanding physicians who have become writers, both lay and professional, are presented. The facts recorded are the fruitful product of the hobby of collecting old medical books, this collection now totaling some 2,000 volumes.

RÉSUMÉ

Quelques anciens auteurs et quelques anciens livres

Il est presenté des détails sur quelques médecins de renom qui furent écrivains, laiques ou scientifiques. Les faits recueilles nous montrent les heureux résultats d'avoir collectionné d'anciens livres de médecine. Cette collection renferme un total d'environ deux mille volumes.

ZUSAMMENFASSUNG

Einige alte Verfasser und einige alte Bücher

Einzelheiten über hervorragende Aerzte die Schriftsteller gewesen sind, sowohl auf allgemeinem wie auch auf medezinischen Gebiet, wurden dargeboten. Die berichteten Tatsachen sind die wertvollen Ergebnisse der Gewohnheit alte medezinische Bücher zu sammeln. Diese Sammlung umfasst nun ungefähr 2,000 Bände.

SUMARIO

Algunos Autores Viejos y Algunos Libros Viejos

Detalles con referencias á algunos médicos prominentes que han sido escritores, ambos lego y profecional, son presentado. La verdad colectada es el producto obtenido en la mania de colectar libros viejos, ésta coleción hace un total como de 2,000 volumenes en la actualidad.

RIASSUNTO

Vecchi autori e vecchi libri

L'autore ci presenta medici prominenti, che furono scrittori, sia laici o scintifici. I particolari raccolti sono il felice risultato di una collezzione di più di due mila vecchi libri di medicina.

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Publication of the Royal Microscopical Society's journal will be continued, although the celebration of the centenary of the society was cancelled. It has been announced that it may be necessary for the time being to curtail the number of ordinary meetings normally held in London during the session.

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Dr. Owen H. Wangensteen, professor and head of the department of surgery at the University of Minnesota Hospitals, has received a grant from the Committee on Scientific Research of the American Medical Association for a study of the physiologic rationale of operations performed for the relief of duodenal and gastric ulcer.

Dr. George R. Minot, professor of medicine at the Harvard Medical School, was presented with the Gordon Wilson Medal of the American Clinical and Climatological Association at the meeting on October 10 at Saranac Lake, N. Y. He gave the Gordon Wilson Lecture before the association on that occasion.

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Dr. Oswald Swinney Lowsley, of New York, has been made an officer of L'Ordre Nationale de Honneur et Mérite by President Vincent of the Republic of Haiti. Dr. Swinney was honored for his distinguished services to the Haitian medical profession in instructing them in urological surgery. He has also been made an honorary professor in the Faculte de Medicine.

INQUIRIES ABOUT PAPERS FOR THE ASSEMBLY, ETC., SHOULD BE ADDRESSED TO DR. CHARLES H. ARNOLD, SECRETARY OF THE SCIENTIFIC ASSEMBLY, 908 TERMINAL BUILDING, LINCOLN, NEBRASKA.

TREATMENT OF FRACTURES OF THE THORACIC AND LUMBAR VERTEBRAE

F. R. W. K. ALLEN, D.M., M.A.O., (Dublin University)

Superintendent, Robertson Medical School

NAGPUR, INDIA

THE treatment of fractures of the thoracic and lumbar vertebrae has been so adequately dealt with by Böhler[1] in his book that there is no advantage to be gained by wasting time and space in recapitulation and readers are advised to study Böhler's book for themselves. I will content myself by indicating in what ways I have departed from the methods which have been so ably described by Böhler.

The method which I employ in the reduction of displacements of the bones of the vertebrae is a combination of the method of applying strong traction to the legs in the prone position, originated by Davies[2], and of the method of raising the upper half of the body in order to produce hyperextension of the spine as described by Watson Jones[3].

TREATMENT OF PARALYSIS

When first seen the patient is thoroughly examined with a view to determining the site of the lesion and the extent, if any, of the paralysis. If extensive paralysis, including retention of urine, is found, a Pezzar's self-retaining catheter is inserted suprapubically by means of a trocar and cannula. Such patients are usually anaesthetic and so local anaesthesia is not called for. I am opposed to the use of an indwelling urethral catheter as advised by Böhler. I have found that a self-retaining suprapubic catheter is more comfortable for the patient and much less likely to give rise to urinary tract infection than an indwelling urethral catheter.

If there is only partial paralysis which includes the bladder, there is no necessity for the self-retaining catheter because it is usual for the paralysis to pass off rapidly if immediate reduction and application of a plaster jacket is carried out. The urine should be drawn off with all aseptic precautions as often as is necessary until the patient commences to pass urine by himself.

In cases of paralysis reduction must be carried out at once. I apply a plaster jacket whether the paralysis is complete or whether it is only partial. The next day, if there is no sign of improvement in the paralysis, I apply skeletal traction to the legs from the tibial tuberosities and place both legs in Braun's splints, as described by Böhler. The plaster jacket is then split down each side from the axilla to the greater trochanter of the femur, thus converting the jacket into an anterior and posterior shell.

In cases without paralysis reduction may be postponed for a day or two, if such a course should be found convenient.

METHOD OF REDUCTION

Anteroposterior and lateral roentgenograms of the spine having been taken, one proceeds to effect reduction of the displacement found. Originally I employed an ordinary Balkan frame. Now, however, I have had constructed a somewhat higher and heavier frame which embodies the same principle. This frame is shown in Figure 1. An even better frame could be made of metal tubing with castors to facilitate movement.

In order to suspend the patient, strips of Newar* are employed. One strip supports the chin. There is one strip for the right arm and another strip for the left arm. A fourth strip supports the chest by passing under and behind the arms. A fifth strip is used for applying traction to the legs. The ankles should be well

*Newar is a webbing-like material, two inches wide, woven of cotton. It is probably not procurable in Western countries and some substitute would be required.

padded with felt before this last strip is applied. The method of application of these strips is illustrated in Figure 1.

The affected vertebrae having been infiltrated with local anaesthesia, the patient is suspended as illustrated in Figure 1, and a lateral roentgenogram is taken. As it is not possible to use a "bucky", the resulting film does not show great detail, but it is sufficient to show whether reduction has taken place.

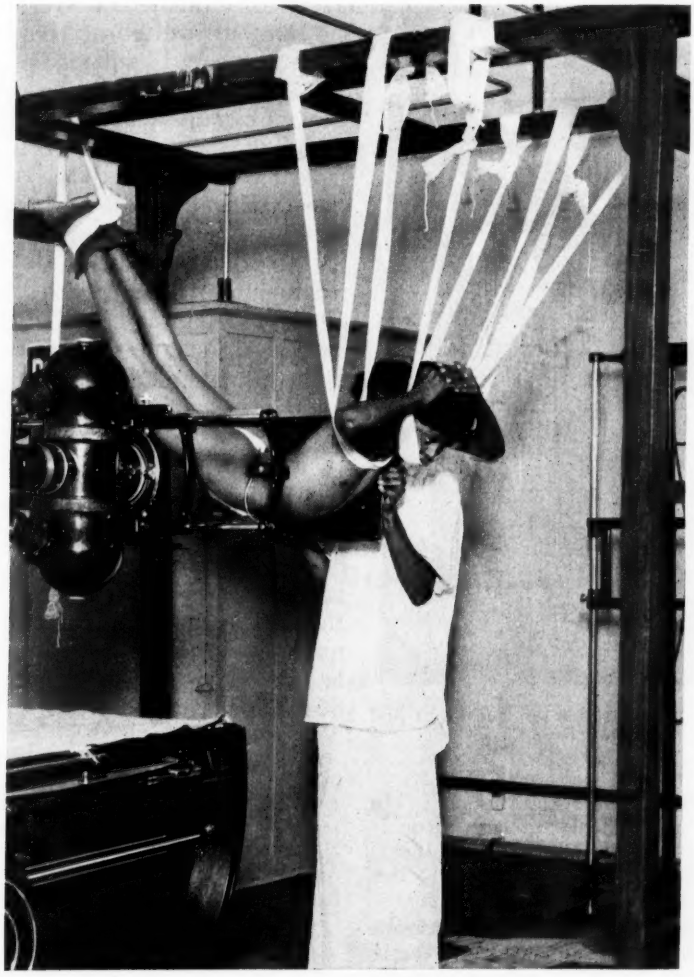

Fig. 1. Patient suspended after local anesthesia has been applied to the injured area. Lateral x-ray film is being taken to see whether reduction is satisfactory.

In the case of lumbar vertebrae, failure to obtain reduction is almost certainly due to the superior articular process of one vertebra having become dislocated onto the dorsal aspect of the inferior articular process of the vertebra proximal to it. As explained by Böhler, it is not possible to effect reduction of this dislocation without open operation. This should be done immediately. The patient should then be resuspended for another x-ray photograph.

When it has been ascertained that reduction has been satisfactorily effected, the patient is sewed into a stockinet vest and a plaster jacket is applied (Fig. 2). The plaster jacket must be

unpadded except at the anterior superior iliac spine, the anterior portion of the iliac crest, the sacrum and the spinous processes of the damaged vertebra; these areas should be protected by felt. It is essential that the plaster jacket grip the shoulder girdle, both in front and behind, and the pelvic girdle, especially over the sacrum and the symphysis pubis. In my experience, it is difficult to obtain adequate pressure on the symphysis pubis; the surgeon himself must pay particular attention to this spot and must not entrust it to an assistant.

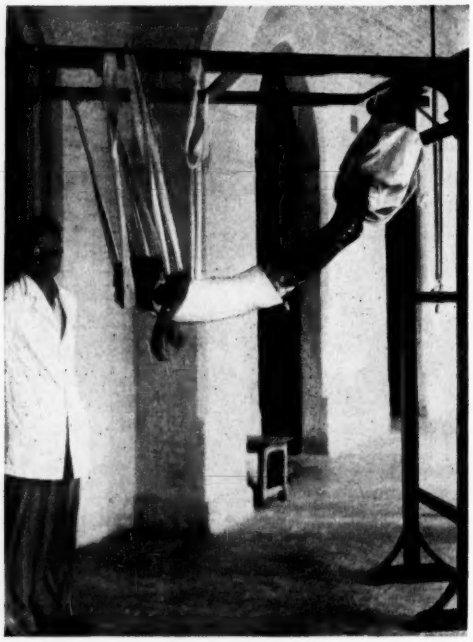

Fig. 2. Plaster jacket applied for fracture of first lumbar vertebra.

In addition to the usual plaster splints made from plaster bandages and utilized for strengthening the plaster jacket, I employ shoulder braces which consist of plaster splints, 2 ft. in length and folded in half longitudinally. These are passed over the shoulder like ordinary trouser braces and are incorporated in the plaster jacket. The patient is then taken down and a window cut out over the abdomen.

If a self-retaining suprapubic catheter has been previously inserted into the bladder, a small hole is now drilled in the plaster jacket about two inches above the symphysis pubis and the distal end of the catheter, which has been strapped along the patient's thigh during the application of the plaster jacket, is now threaded from within outward through the small hole in the plaster jacket. The patient is thus made fairly comfortable.

FRACTURES OF TRANSVERSE PROCESS

Fracture of the transverse process of the lumbar vertebrae is much more common than is supposed and usually passes undiagnosed unless a skiagram is taken of almost every case of severe strain of the muscles of the back. A typical cause of this type of injury occurs when a person seated in the rear seat of a motor car is suddenly flung forward. I find the most satisfactory treatment in these injuries is to supply adequate splintage, utilizing strips of zinc oxide strapping. Pain disappears immediately and the patient is then able to do light work.

SUMMARY

A method for reduction of displacements of the bones of the vertebrae is described. This is a combination of the method of applying strong traction to the legs in the prone position and of the method of raising the upper half of the body in order to produce hyperextension of the spine.

REFERENCES

1. Böhler: The Treatment of Fractures. 4th English edition, translated by Hey Groves, 1936.
2. Davies: J. Bone & Joint Surg., vol. 11, 1929.
3. Watson Jones: Brit. M. J., Feb. 21, 1931.

RÉSUMÉ

Traitement des fractures des vertèbres, thoraciques et lombaires

L'auteur décrit une méthode pour la réduction des déplacements des os de la colonne vertébrale. La méthode combine une forte traction appliquée aux jambes (le sujet étant couché sur le ventre) à l'élevation de la moitie supérieure du corps; le désideratum est d'obtenir une hyperextension de la colonne.

ZUSAMMENFASSUNG

Die Behandlung der Brust und Lendenwirbelfrakturen

Es wird eine Methode für Korrektur der Verschiebungen der Wirbelknochen angegeben. Es ist eine Kombination der Methode einen starken Zug an den Beinen in gesenkter Lage anzubringen und der Methode die obere Körperhälfte aufzurichten, um auf diese Weise eine Überstreckung der Wirbelsäul zu erreichen.

SUMARIO

Tratamiento de las Fracturas de las Vertebras Toraxicas y Lumbares

Un método para reducción del desplazamiento de los huesos de las vertebras es descrito. Este es una combinación del método de aplicar tracciones fuertes de las piernas en la posición de pronación y de el método de levantar la mitad superior del cuerpo con el objeto de producir hiperextención de la espina dorsal.

RIASSUNTO

Trattamento delle fratture delle vertebre toraciche e lombari

Viene discritto un metodo di riduzione del dislocamento delle ossa vertebrali. Questo è una combinazione del metodo di applicare trazione forte sulle gambe in posizione prona, e quello di sollevare la metà superiore del corpo, da produrre una iperestensione della spina.

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Awarded Keys

Four physicians were awarded gold keys in recognition of distinguished accomplishments in physical therapy at the meeting of the American Congress of Physical Therapy held in New York City on September 6. Awards were made to **Dr. Edward C. Titus,** of New York, for his research in electrotherapy and light therapy; **Dr. A. Bern Hirsh,** of New York, for his organization of physical therapy departments in hospitals and clinics; to **Dr. Joseph Riviere,** of Paris, for the introduction of electro-surgery into medical practice; and to **Dr. James B. Mennell,** of London, for contributions to physical medicine, particularly in massage. The presentation was made by **Dr. William Schmidt,** prseident of the congress.

Dr. William Combe Wilson has been appointed to the regius chair of surgery in the University of Aberdeen made vacant by the appointment of Professor James R. Learmonth to the chair of surgery in the University of Edinburgh.

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Sir Frederick Banting, professor of medical research at the University of Toronto, has enlisted as captain in the fifteenth General Hospital of the Canadian Army Medical Corps.

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Charles F. W. Illingworth, M.D., F.R.C.S., has succeeded **Prof. Archibald Young** as Regius Professor of Surgery in the University of Glasgow. Prof. Young's term of office ended September 30.

THE NATIONAL ASSEMBLY OF THE UNITED STATES CHAPTER OF THE INTERNATIONAL COLLEGE OF SURGEONS WILL BE HELD FEBRUARY 11 TO 14, 1940, AT VENICE, FLORIDA, UNDER THE DIRECTION OF INTERNATIONAL PRESIDENT-ELECT DR. FRED H. ALBEE AND THE PRESIDENCY OF DR. FREDERICK M. DOUGLASS.

VOLVULUS OF THE ENTIRE SMALL INTESTINE AND TORSION OF MESENTERY

A CASE REPORT

RALPH GOWDY, M.D., F.I.C.S.

MIAMI BEACH, FLORIDA

VOLVULUS of the small intestine, and particularly of the entire small intestine without involvement of the cecum and the ascending colon, is a comparatively infrequent cause of intestinal obstruction. It is encountered rarely. Its diagnosis may not be made promptly enough to insure successful operation. In fact, the condition may not be recognized even when the abdomen is opened, may be found only at autopsy, or failing that, may not be diagnosed at all. The reporting of a case, therefore, occurring in a two-year old child who was operated upon with prompt recovery, may not be without interest.

INCIDENCE

The incidence of volvulus varies as to country and as to age and sex. Vaughan (1903), in this country, collected 60 cases of volvulus. About 30 per cent were of the small intestine and of this group there were 20 cases of torsion of the entire small intestine and mesentery. He reportd a personal case. Lawson (1927) brought the number up to 77 including a personal case. He stated that more than half of all cases of volvulus are at the sigmoid flexure and a smaller number at the cecum; the small intestine is the least commonly affected and in only a small proportion the entire small intestine is involved. The Massachusetts General Hospital in 20 years had 239 cases of intestinal obstruction, 29 of which were cases of volvulus; of these, 10 were of the small intestine and one was of the entire small intestine with torsion of the entire mesentery. At the London Hospital in 13 years there were 669 cases of intestinal obstruction, 27 of which, or 4 per cent, were due to volvulus, in 7 the small intestine being involved.

In the Italian literature, Margarucci and Stoppato (1925) reported 21 cases of volvulus of the small intestine in 723 cases of occlusion. Nino della Mano, in 342 cases of intestinal occlusion, reported 6 cases with involvement of a loop of small intestine; in one case there was complete torsion of the mesentery. Pizzagalli reports from the surgical service of Milan Hospital, 1923-1931, 402 cases of occlusion, 18 of the small intestine.

The incidence of volvulus is greatest in Russia and the Scandinavian countries. Faltin (Helsingfors) collected 153 cases of obstruction; 78, or 51 per cent, were due to volvulus; 22 per cent occurred in the small intestine. Spassokukozky (Russia) had 28 cases personally in 11 years and Skljaroff had 36 cases in about the same period. The 28 cases occurred in 47 cases of occlusion. This affords an example of the greater frequency of volvulus of the small intestine in the Russo-Scandinavian as compared with the Anglo-American, Latin and German countries. In 200 cases of pyloric stenosis (Spassokukozky), five were complicated by volvulus of the small intestine.

SEX

A number of authors mention a greater frequency in the male sex with such ratios as 2:1 and 3:2 (Donati, Wilms, Skjaroff, Lawson). McIver found a greater frequency in males. McKechnie and Priestly reported 34 cases of volvulus of the small intestine in 25 years at the Mayo Clinic (37 operations, 3 of

which involved the entire small intestine; there were 22 males and 12 females. Leonard, reporting 22 cases of volvulus at the Newton Hospital in 10 years, had 13 males and 9 females. Pizzagalli reports cases in 3 males and one female. In Weible's series of 64 cases, there were 51 males and 13 females. Isaacs, from St. Bartholomew's Hospital, records 16 males and 9 females.

AGE

Volvulus, although quite generally attributed to congenital defects, is definitely associated with adult life. Lawson gives the average age as 45 years. Isaac's series gave only two cases in patients under 20 years of age; 12 were between 20 and 50 years; 10 between 50 and 70, and one over 70. However, single cases of volvulus of the newborn have been reported (Trillat and Boulez, Tissier and Mercier, Metzger, Dott, Gonnet and Desjacques, Oberling, Spencer, Anderson, and Pitt). Trillat and Boulez believe that cases in the newborn may be more frequent than their diagnosis or verification would indicate. When a newborn of apparently normal constitution dies without affording satisfactory clinical justification, intestinal occlusions are very frequently found — invaginations, diaphragmatic hernias, and volvulus. Volvulus leads in such occlusions, according to the statistics of Ecoffet (20 per cent).

EMBRYOLOGY AND ETIOLOGY

Borow and Borow say that, when one considers the embryology of the alimentary canal, one is surprised that anomalies of intestinal rotation are not more common, and they, like Trillat and Boulez, believe that such cases occur more frequently than recorded, owing to the absence of symptoms.

Normal embryology of the alimentary canal is described and illustrated by Dott. While true malposition of the foregut and hindgut is comparatively rare, 45 records of gross developmental errors in the disposition of the midgut were found by him in a brief review of the literature. Congenital factors frequently noted are: a long or relaxed mesentery, short attachment of the mesentery root, shortening of the vertical attachment to the posterior abdominal wall, insufficient fixation of the intestine, nonrotation of the common mesentery and of the large and small intestine during embryological development, and an unusually long small intestine (Wechsberg).* Cases in the newborn, in infants, and in young people are commonly associated with malformations of the mesentery or of the intestine (Dott, Poynton, Kredel, Dacker, Donati, Boheme, Eschbach, Hertig, Leischner, Morimoto, Pescatore, Phelip, Poulsen, Travinski and others), the greatest number being, it would seem, due to a common mesentery (Azbukin, Beerger, Dietricj, Billington, Danielson, Helmsmüller, Steinke, Tagehansen, Kirchenberger, Küttner, Leichtenstern, Perez-Fontana, Vigi, and others). The volvulus in these cases with common mesentery involve more or less extensively the small intestine, cecum, and not rarely the ascending and even the transverse portions of the colon.

Acquired structural changes are also discussed in the etiology of volvulus, more especially in the adult. Frequently such changes are associated with previous operations or inflammatory adhesions or bands following appendicitis or peritonitis from any cause. The presence of a cyst or tumor may change the weights and balances of the mechanical arrangements within the abdomen. Abdominal contusions are also found among the cases reported. However, Luke says that congenital causes were responsible for all cases that he collected of volvulus of the entire small intestine. Interesting in this connection is the case reported by Fletcher in which volvulus

*For a bibliography on congenital anomalies of the intestine see Dott.

of the small intestine, beginning about eight inches above the cecum, had occurred at some period in intrauterine life. It caused trouble only when peristalsis started. The colon was collapsed and undeveloped below the volvulus.

Predisposing or activating causes mentioned repeatedly in the literature are unusual effort or movements of the body, intestinal distention, and peristaltic activity of the intestine. The greater frequency of volvulus of the small intestine in Russia and Scandinavia is attributed to the elongated jejunum and to the repeated sudden filling of the intestine with poorly digestible food (Pupini, reporting volvulus of small intestine in an adult). McKechnie and Priestly call attention to the coarse, voluminous, poorly prepared food, associated with meteorism, and note that knots are more common in inhabitants of Finland than among the Finns of Minnesota. Lawson states that vegetarian or bulky diets result in intestinal atony or chronic distention, thus largely contributing to a twisting of the bowel. Purgation may be a factor in disordered peristalsis.

However, cases are frequently reported in which congenital, acquired, or predisposing causes are not in evidence. A successful operation carried out with a minimum of trauma does not afford the same opportunity for etiologic study as an autopsy.

DIAGNOSIS

Diagnosis is always very difficult and often impossible. Naturally the clinical picture is varied according to the location and extent of the volvulus, the degree of rotation and the tightness of the twist. Symptomatology, often very meager, may be completely absent (Trillat and Boulez), especially in the newborn and in infants.

Pain was the first symptom in 82.9 per cent of the cases analyzed by McKechnie and Priestley. In a number of cases pain was so severe as to require morphine (Stalker). Previous colicky attacks and constipation were noted in adults. Nausea, vomiting, constipation and meteorism are common. Vomiting is sometimes fecal or meconial. Temperature is frequently noted as normal with the pulse about 100. Such symptoms are not pathognomonic of volvulus. The behavior of acetonemia, studied especially by Poynton in infants, the initial rapid fall of blood pressure, and the absence of borborgimi in the initial phases cannot be depended upon for differential diagnosis with safety. When the rotated tract is extensive and the torsion occurs with great rapidity, it may be impossible to differentiate the condition from that of peritonitis with perforation, acute pancreatitis, and occlusion of mesenteric vessels. Distention of the abdomen, resistance of the walls, and extreme pain may occur with greater rapidity than in perforations and pancreatitis. Diagnoses of appendicitis, ureteral stone, or gallstone colic may not be ruled out.

Patients with volvulus do not indicate even in an approximate manner the location of the pain in many cases. Particularly in the newborn, pain may not be in evidence. Bryant, Cabot, Morimoto, and other authors describe cases of volvulus of the small intestine with melena. Rapid appearance of abdominal fluid is noted at operation or autopsy more frequently than clinically. Not all cases present evidence of distended loops, peristalsis, and asymmetry. Closure of the bowel is not always complete. Absence of constipation often delays diagnosis (Leonard). In the newborn, meconium was expelled up to the time of operation or until death occurred (Metzger).

Lawson, in his collection of 77 cases, noted four in which diagnosis was not made after the abdomen was opened (Debrie, Kirmisson, Delbet, and Delore).

Radiologic diagnosis is seldom mentioned and usually the picture which is taken without preparation with barium enema in intestinal occlusion calls attention to stasis situated at a distance from the lesion. Gautier reported a case of volvulus in which "the radioscopic image was characteristic and permitted localization in absolute fashion of the lesion in the small intestine." It was sufficient, he stated, to indicate the necessity of making a median incision. His presentation lacks interest, however, because he was unable to show his findings to his colleagues. In Stalker's case, a roentgenogram of an adult revealed gaseous distention of several loops of small intestine with probable obstruction of the ileum.

TREATMENT

Lacking a more definite diagnosis than intestinal obstruction, or acute surgical abdomen, the indications for immediate laparotomy are none the less urgent. There must be no waiting for evidence of complete obstruction, for distention of the abdominal wall, or any other of the cardinal symptoms. Stalker delayed operation in his patient, an adult, because he believed him to be too ill for surgery. His condition was brought to a maximum degree of improvement by means of blood transfusion, intravenous administration of saline, and continuous duodenal suction and the general measures of conservative management of intestinal obstruction and peritonitis. Operation was then undertaken without further delay. Without operation there can be only a fatal outcome.

Operation is now rather generally limited to simple detorsion and return of the bowel to the abdominal cavity in a position as nearly normal as possible, with the least possible trauma and in the minimum of time. The intestine must be eviscerated and rotated *en masse* and not loop by loop.

In some of the early cases, gastrojejunostomy or some short-circuiting anastomosis was performed, followed by death in a few hours. Such operations as folding or shortening of the mesentery, fixation of the cecum, and similar procedures, have now been completely abandoned. Philipcowicz sutured the mesentery to the posterior abdominal wall after replacement in good position, hoping thus to prevent recurrence. While a history of previous attacks is frequent, postoperative recurrence does not seem to be a danger. Certainly in the newborn and in infants, in a condition of poor operative risk, the prompt completion of the operation with a minimum of handling overrides in importance all other considerations. Resection is necessary if the vitality of the intestine is definitely compromised (Jacques, Droegemueller, and Buchbinder). The appendix is removed when found swollen or inflamed.

PATHOLOGY

Pathology found at operation or at autopsy is that of intestinal obstruction and interference with circulation. The condition of the intestine was satisfactory in the majority of cases.

The rotated bowel is discolored, violet to black, depending upon the amount of circulatory interference; the mesentery is injected, the bowel collapsed below the twist. The colon may appear smaller than the distended small intestine. The stomach may also be markedly dilated, even to twice normal size. In one instance, in an adult, the greatly distended intestine popped out of the abdominal incision and ballooned out in loops like an inflated inner tube of an automobile tire. Spontaneous perforation occurred in a newborn with partial volvulus (Trillat and Boulez). In an adult, manipulation caused rupture of the distented bowel (Stacy).

In most instances, according to Lawson, the twist is through 180 degrees, but may be 90 degrees (even in a fatal case) up to that of Garrow's patient who had a twist of three and one-half times

or through 1260 degrees. Vaughan found the direction of the torsion to be

Free fluid in the abdominal cavity is a common finding.

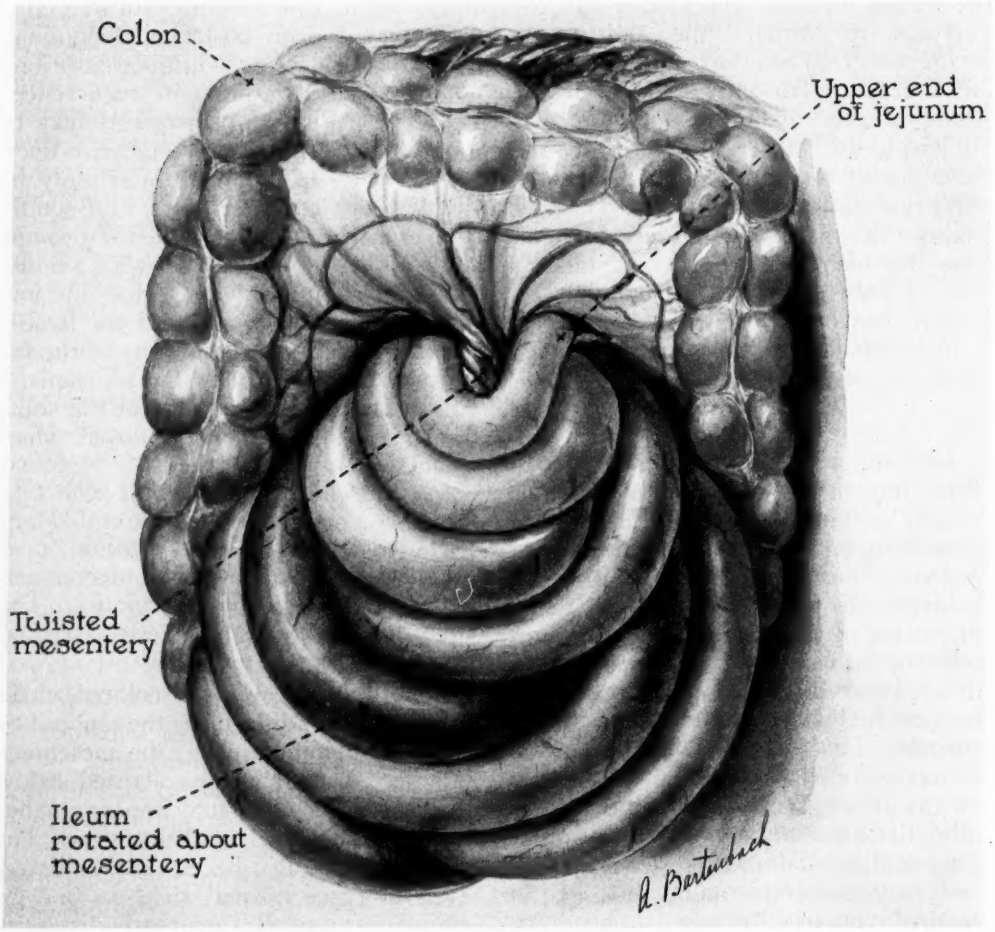

Fig. 1. Volvulus of entire mass of small intestine occurring in a two-year old child.

clockwise in 24 and counterclockwise in two cases. The rotation, it seems, is commonly in a clockwise direction (62 per cent, according to Donati) due to the obliquity of the insertion of the mesenteric root (Henke-Lubarsch, Kleinschmidt and Hohlbaum, Wilms, Rouville, Braun and others).

PROGNOSIS

Lawson reports, in the 77 collected cases, operation in 57 with recovery in 25 (43.8 per cent); Weible, 65 cases, 23 recoveries. All successful operations were performed within 48 hours after the patients were seen. In late operation the cause of death is due to injury to the

sympathetic plexus from strangulation of the small intestine and rapid absorption of toxins. The general condition of the patient and the pathologic condition found at operation are important factors.

For acute volvulus of the small intestine the mortality for cases in which only the ileum is involved is about 30 per cent lower than for those in which the entire small intestine is involved. For those cases operated after 48 hours the rate is 75 per cent and over. Nino della Mano reports six cases of detorsion with one death. Dott reports a case of prompt recovery after detorsion in a boy of five with chronic volvulus (Rixford's case). A recovery after operation for volvulus in a four-day-old infant is reported by Borow; the twist was reduced by rotation and the abdomen closed without drainage. Postoperative treatment included blood transfusion; clysis of saline solution and 5 per cent dextrose; enemas of milk and molasses; lavage, irrigation and stupes. This patient, according to Borow, was the youngest on record in whom recovery occurred.

CASE REPORT

On May 3, 1938, a boy two years old, apparently in perfect health, was suddenly seized with severe abdominal pain while out for a ride in a go-cart. There had been no unusual food ration. He had had his breakfast at 8 a. m. and the onset of pain was at 10:30 a. m. His nursemaid quickly took him to his home and an internist was called. The child vomited once a few minutes after onset of pain. There were no bowel movements. When the internist arrived, about one hour after the onset, she found the child in shock, the abdomen was very sensitive to touch, and a palpable mass could be felt above the umbilicus. The internist made a rectal examination but no mass could be felt. There was no blood on the examining finger as is usual with intussusception. Rectal temperature was 99° F. A diagnosis of acute intestinal injury due to volvulus, internal hernia, or intussusception was made. I was called in consultation and agreed with the diagnosis made by the internist.

A white blood count was made at the home, which showed 14,000 leucocytes and 90 per cent polymorphonuclears, of which 29 per cent were stab forms.

The child was then taken to the St. Francis Hospital where a pediatrician and another surgeon met us in further consultation. By this time the child showed little shock and seemed to be better.

A barium enema roentgenogram was made and the colon was found to be fairly normal. The report read: "The entire colon is somewhat larger than average normal. There is no evidence of organic abnormality. There is some collection of gas in the small bowel in the right upper quadrant, but it is not marked. Impression: Essentially normal colon; moderate amount of gas in the small bowel in the right upper quadrant."

A second blood count was made at 2:30 which showed 11,800 leucocytes, 83 per cent polymorphonuclears and 11 per cent stab forms.

A palpable mass could still be felt above the umbilicus, but it was not so marked as it was soon after the onset of pain. We still felt that a surgical condition existed, but decided to give intravenous normal salt solution plus 5 per cent dextrose before opening the abdomen. During the time the intravenous solution was being given the child's condition grew worse. The temperature began to rise rapidly and a third blood count at 5 p.m. showed 16,700 leucocytes and 85 per cent polymorphonuclears with 41 per cent stab forms. The red count and hemoglobin were within normal range for all counts. At the time of operation the temperature was 102°.

Operation. The abdomen was opened by the high midline incision about seven hours after onset of pain. Free bloody fluid was found on opening the abdomen. On lifting up the transverse colon and omentum, the small intestines appeared, twisted and massed together, in the upper abdomen. The entire mass of small intestines up to the duodenum was rotated about the mesenteric axis—from left, across in front, to right (Fig. 1)—so that the folds of mesentery were tightly twisted together close to the spine. Some loops of small intestine were greatly distended and discolored. When this mass was untwisted, we found a marked exudate between the folds of mesentery, where they had been pressed together. Many of the lymphatic glands in these folds were as large as small marbles and showed hemorrhagic areas. There were no adhesions in the abdomen to have caused the extensive volvulus of the entire mass of small intestines. It is difficult to explain the mechanism by which it took place.

When the mass was untwisted, the intestines were replaced in the abdomen and the abdomen was closed without drainage.

Postoperative Course. Intestinal distention was troublesome for a few days, but the child made a good recovery and has remained well since.

The postoperative measures consisted of administration of 250 cc. of normal saline solution and 5 per cent dextrose, 3 and 12 hours after operation, by the intravenous method. Nembutal was given by rectum as needed to control restlessness. Water was given by mouth in small amounts, beginning 12 hours after operation. An electric pad was applied to the abdomen for distention. Orange juice, two ounces, was given by mouth 24 hours after operation and normal saline, two ounces, was given by retention enema every three hours. The child had very small veins which made the giving of nutrition or fluids by the intravenous method difficult. We were prepared to give blood transfusions if necessary; but none were given, since the red blood count and hemoglobin were always within normal range. On May 5, two days postoperative, the count showed red cells 4,180,000, hemoglobin 83 per cent, leucocytes 7,850, polymorphonuclears 58 per cent, stab forms 18 per cent, segmented cells 40 per cent, lymphocytes 41, mononuclears 1. Three days postoperative a rather sudden elevation of temperature and pulse was observed along with frequent, watery stools. This was probably a reaction due to the bruising and twisting of the mesentery and to adenitis in the twisted mesentery as found at operation. This reaction lasted about 24 hours, then rapidly subsided. Kaomagma was given by mouth for watery stools and apparently was helpful. At about this time an x-ray of the child's chest made by means of a portable x-ray showed the lungs to be normal.

It is interesting to note that the child's parents were well-to-do and had given him the best of care in every way. A pediatrician had examined the child frequently and had regulated the food and the manner of living from the time of birth.

SUMMARY

A child two years old apparently in perfect health was suddenly seized with extreme abdominal pain and shock with no apparent reason. A barium enema revealed a normal colon. The blood count and temperature indicated acute abdominal injury.

Operation revealed twisting of the entire mass of small intestines at the mesenteric attachment with no involvement of the large bowel. The condition was easily relieved by surgery and the child has been well since.

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RÉSUMÉ

Volvulus de la totalité de l'intestin grêle

Un enfant, âgé de deux ans et, apparemment, en excellente santé a une attaque soudaine et aiguë de douleur abdominale et de choc sans cause apparente. Un lavement baryté montre un côlon normal. Le compte globulaire sanguin et la température indiquent une lésion abdominale aiguë. A l'opération, on trouva un torsion de la masse entière de l'intestin grêle à son attachment mésentérique. Le gros intestin ne présentait aucune lésion. On corrigea la condition et l'enfant se rétablit tout-à-fait.

ZUSAMMENFASSUNG

Volvulus der Gesammten Masse des Dünndarms

Ein zweijähriges Kind, das anscheinend vollständig gesund war, erkrankte plötzlich mit sehr starken Leibschmerzen ohne ersichtliche Ursachen. Barium-Enema zeigte normalen Dickdarm. Blutbild und Fieber sprachen für eine akute abdominelle Erkrankung. Bei der Operation wurde eine Drehung des gesammten Dünndarms um die Mesenterialwurzel gefunden wobei der Dickdarm nicht beteiligt war. Der Zustand konnte durch die Operation leicht beseitigt werden und das Kind ist seit dieser Zeit ohne Beschwerden.

SUMARIO

Vólvulos de la Masa Entera del Intestino Menor

Un niño de dos años de edad, aparentemente en perfecta salud, fue repentinamente atacado con dolores abdominales y shock sin causa aparente. Un enema de barium reveló un cólon normal. El conteo de la sangre, y la temperatura indicaba una lesión abdominal aguda.

La operación demostró que la masa completa del intestino delgado estaba torcido en su inserción mesentérica sin afectar el intestino grueso. La condición fue facilmente aliviada con cirugía y el niño ha estado bien desde entonces.

RIASSUNTO

Volvulo dell'entero massa dell'intestino tenue

Un bambino di due anni, apparentemente in perfetta salute, fù colpito improvvisamente da terrifici dolori addominali con shock, senza una causa apparente. Un clistere con bario, rilevò un colon normale. L'esame del sangue e la temperatura indicavano lesione addominale acuta. All'operazione l'entera massa dell'intestino tenue fu travata in torsione al suo attaccamento mesenterico, senza interessamento del colon. Questa condizione fù facilmente corretta dall'atto operatorio, e il bambino si ristabili completamente.

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FELLOWSHIP DUES, AS WELL AS DUES FOR MEMBERSHIP AND ASSOCIATE MEMBERSHIP, ARE PAYABLE NOW AND SHOULD BE SENT TO DR. BENJAMIN I. GOLDEN, DAVIS MEMORIAL HOSPITAL, ELKINS, W. VA.

BASAL METABOLISM: PRACTICAL CONSIDERATIONS

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IN a previous publication[1], certain practical observations relative to the basal metabolism test, with particular reference to thyroid disease, were discussed. Because of the manifest continued misapplication of the procedure and the apparent confusion or lack of understanding regarding the significance of this frequently invaluable laboratory aid, it is deemed advisable to reevaluate its use in conformity with more recent experience.

VALUE OF CLINICAL FINDINGS

Unintelligent resort to laboratory procedures and inordinate reliance upon various tests of doubtful merit are a menace to scientific diagnostic progress. Dogmatic dependence upon laboratory shortcuts is, like snap-diagnosis, "a rapid method of arriving at the wrong conclusion." The subordination of methodical reasoning and systematic observation to technical measures results in a fallacious approach to any diagnostic problem. Incompetent determination and misinterpretation of laboratory findings are responsible for serious errors. Those who resort to basal metabolic tests routinely in suspected thyroid disease, before clinical studies are complete, are, to say the least, not serving their patients well.

Metabolic readings are of inestimable value in the study of thyroid disease, but they should not supplant clinical observation. They are a valuable link in the chain of scientific evidence pointing to certain pathologic entities. The diagnosis of thyroid states based upon the metabolic rate alone often leads to errors.

FACTORS AFFECTING RATE

Elevation of Rate. Metabolism rises not only in hyperthyroidism, but also by desultory increments in certain diseases previously enumerated[1]; and combinations of these several conditions may affect the basal metabolic rate variously. For example, an emaciated diabetic patient with fever may present a normal metabolic rate through counteraction of the increased metabolism due to diabetes and fever by the decreased metabolism resulting from cachexia. This hypothetical possibility establishes the necessity for clinical judgment in the evaluation of metabolism reports.

The importance of ascertaining the basal metabolism rate in a patient suffering from thyroid disease is not disputed. It is deemed more important, however, to acquire a knowledge of the cardinal symptoms and the characteristic physical signs of thyrotoxicosis. Even though an elevated metabolism rate is an inseparable part of toxic goiter, knowledge of the basal metabolism rate will not assist in the diagnosis nor will it reflect the severity of the thyrotoxic syndrome in all cases. In a small percentage of goitrous patients the metabolic rate will be markedly elevated without correspondingly severe clinical manifestations. In a larger number of similarly diseased individuals the exaggeration of symptoms will be strikingly disproportionate to the low elevation in the metabolic rate.

Febrile diseases, particularly those which are latent in their clinical manifestations and whose presence therefore is commonly unsuspected, increase the metabolic rate approximately 8 per cent for each degree of fever rise, whereas in mild cases of hyperthyroidism the total increase in metabolism is only about 15 per cent.

Those conditions that may prove confusing on the basis of metabolic criteria are acute pericarditis, acute endocar-

ditis, leukemia, pulmonary tuberculosis and Hodgkin's disease. From the standpoint of differential diagnosis, it must be recalled also that hyperpituitarism, gigantism and acromegaly increase the metabolic rate on occasion up to 40 per cent above normal and that cardiac decompensation may also raise it to a considerable level. During pregnancy the metabolic rate rises gradually until term, when the total increase averages about 20 per cent above the previously normal rate.

Lowering of Rate. Minus basal metabolic rates are common to normal as well as abnormal physical states. Patients thus affected may be classified into two groups: the physically normal and the physically abnormal. Physically normal individuals with low basal rates may be the residents of cold climates or the victims of severe insomnia, undernutrition, depressing drugs or allergy. The physically abnormal group may show minus metabolic rates either in combination with minus values in the heart rate, hemoglobin percentage, blood pressure readings, respiratory rate and other physiological factors; or in combination with actual evidence of gross pathological processes, such as undernutrition, obesity, dehydration, cachexia, hypopituitarism, hypothyroidism or hypoadrenalism. In the last three disease entities the basal metabolic rate may vary between minus 20 and 35 per cent.

Age. The determination and interpretation of the basal metabolic rate of infants and children lacks standardization. Intelligent cooperation of a child under 7 years of age cannot be assured, and to acquire dependable readings special laboratory technic and skill are required. Insufficient knowledge concerning the physiologic processes of growth and their effect upon the metabolism of children makes for difficulty in basal rate determinations. Standards derived in accordance with total calories for weight and height are universally applicable.

Much that is stated here is common knowledge; yet there is justification for the intended emphasis when confronted with the frequency with which basal metabolism tests are requested in unwarranted circumstances. Except for thyroid and pituitary disease, pathological lesions constantly producing variations in the metabolic rate are readily diagnosed by the usual clinical methods. However, a knowledge of those conditions in which the metabolic rate is affected is essential to the proper application and interpretation of the test.

INDICATIONS FOR USE

Metabolism tests are applied as an aid in differentiating hyperthyroidism from neurocirculatory asthenia and early tuberculosis; in differentiating toxic from nontoxic goiter; in estimating the degree of toxicity in a given case; in determining whether the toxicity remains *status quo* or whether it is rising or falling, as shown by repeated tests; and in evaluating and instituting preoperative treatment of hyperthyroidism. These tests are also of assistance in the evaluation of radiation therapy in hyperthyroidism and in the estimation of the residual basal metabolic rate during remission or after either radiation therapy or operative procedures on the thyroid gland. Less frequently, metabolism tests may be used in the differentiation of hypopituitarism from eunuchoidism, of Addison's disease from myxedema, more rarely between Addison's disease and chronic nephritis; to distinguish simple from pathological obesity; and as a guide in the treatment of hypothyroidism.

Hyperthyroidism. The efficacy of metabolic criteria in the diagnosis of early hyperthyroidism has not been established by experience. However, the absence of operative urgency in those cases permits of repeated tests which attain their greatest diagnostic value when performed by a competent technician and

when consistently correlated with clinical evidence. Patients in whom the diagnosis of hyperthyroidism is obscure should be instructed to return in two months for further observation. In the interim, one or more of the cardinal symptoms of toxic goiter may become manifest and the calorimetric record conclusive.

The metabolism rate is not a dependable factor in deciding the optimum period for operation in thyrotoxicosis, although Mayo, in 1921, showed a decreased mortality for operations performed during a falling as compared with those performed during a rising rate. Not a few thyrotoxic patients have been operated upon inopportunely, with resultant serious consequences, because the surgeon relied upon untrustworthy metabolic data. However (and this is not only because of the many possibilities of technical errors in laboratory procedures), the clinical condition of the patient remains the best criterion for safe operability. The age of the patient, the duration of the disease, the amount of weight lost, the weight gained while under treatment, the tension and rate of the pulse, the general response to rest and iodine therapy, the mental state and the nervous reactions during physical examination are considerations that best indicate the degree of surgical risk in thyrotoxic cases.

Hypothyroidism. The comparative rarity of hypothyroidism clinically is evident by the few requests for metabolic readings in which a low rate is suspected. It is interesting to note, however, the frequency with which low rates are discovered, quite by accident, in follow-up examinations and in so-called routine metabolism tests. A basal metabolic reading in the downward direction, although less impressive than a high reading, is equally important to an effective plan of treatment; and it is quite remarkable how quickly these minus rates approach the normal following the administration of thyroid extract. In the treatment of thyroid hypofunction, repeated metabolism tests will guide the physician in the quantitative regulation of medication.

ELIMINATION OF ERRORS

If confidence is to be placed in basal metabolic rate estimations, as must be the case in the study of thyroid disease, then those estimations should be of the greatest reliability. Perfection should be sought through directed attention to the following details.

Competence of Technician. Understanding how a thing is done and actually doing it are distinctly different matters. It is no more essential that a surgeon be familiar with the technical details of performing a metabolism test than it is that he should be able to do a blood Wassermann test. He should know the theory of both; but it is not necessary that he should specialize in their details. An acquisition of knowledge concerning the minutiae is for the technician. Only those who are competently trained and who are sufficiently experienced to interpret properly the findings should be relied upon for metabolism tests. All hospitals should delegate this field of endeavor to a particular technician who should be held unremittingly responsible for the integrity of the apparatus and for gross technical errors.

The importance of this office cannot be too greatly stressed. Mature understanding, an easy, pleasant demeanor and absolute honesty on the part of the technician are requisite to the best interests of the goitrous patient. A recent experience, wherein a technician inquired of an intern as to the staff opinion of a patient's toxicity and then made the metabolic reading conform to her misinformation, represents a case of flagrant technical incompetence.

It is necessary that technicians be familiar with the regularity in appearance of typical graphs and that those graphs be rejected as meaningless whose curves do not correspond to what experience has shown to be characteristically regular. It should also be the privilege of the technician to suggest the repetition of tests whenever conviction indicates that previous tests are in error. A continuously regular graph over a period of six consecutive minutes is believed adequate.

Mechanical Perfection. The apparatus, in order to afford the greatest satisfaction, should be simple and of good, standard quality, although not necessarily expensive. It should be examined frequently for defects and if leaks are found, it should immediately be repaired. The necessity for a closed breathing system requires the exclusion of leaks before each test. Technicians who make numerous metabolism estimations find it advantageous to use two sets of apparatus, frequently checking the results obtained with one against those obtained with the other. The Soda-lime, through which the expired air is passed, must be of specific character and consistency. It should be fresh and the granules should be of proper relative proportions and sufficiently hygroscopic to absorb moisture from the expired air. When stale, Soda-lime tends to cake and channel. The air then passes over the surface or by way of the channels instead of through the lime, a circumstance resulting in the failure of carbon dioxide extraction. Carbon dioxide stimulates respiration, which in turn makes for increased muscular activity and greater utilization of oxygen, thereby increasing metabolism.

Tranquilization of Patient. Transient conditions that induce the expenditure of energy, such as muscular exertion, absorption of food and emotional states, will increase the rate of metabolism. Muscular effort requires of the tissues an expenditure of chemical energy equivalent to the work done. This increases the basal metabolic rate from a few per cent for slight movements to many per cent for extensive motion. Ordinarily this effect subsides in twenty minutes after the muscles are at rest.

Food in the process of absorption greatly increases the metabolic rate. Lusk believes that the direct stimulation of the tissue cells to utilize more oxygen is responsible and refers to this phenomenon as "the specific dynamic action of foods."

Emotional states raise the metabolic rate in proportion to the intensity of the emotion. A fit of anger is capable of inducing a rate several hundred per cent above normal. Patients who are thyrotoxic are readily stimulated beyond usual proportions. Those of neurotic temperament, even in the absence of thyrotoxicosis, may become so excitable as to interfere materially with the proper performance of a metabolism test.

Therefore, the optimum period for a basal determination is the one during which the body is expending the smallest amount of energy, namely, when there is complete absence of emotion, when the gastrointestinal tract is free of food and when the voluntary muscles are at complete rest. In order to assure these optimum conditions, the patient should be hospitalized in a private room at least 24 hours, preferably 48 hours, before the test is made. The hospital room should be in a quiet section of the institution, preferably some distance from the wards. The admission bath and other routine procedures that are likely to stimulate the nervous patient are best deferred. The evening meal should be light and easily digested. No food should be allowed during the 14 hours preceding the test. The patient should be apprised of the significance and assured of the simplicity of the procedure. He should be confidently encouraged to cooperate. If he is troubled with insomnia

or restlessness during his first night in the hospital, the test should be delayed until rest and relaxation are acquired. Sedatives should not be administered. Reading and the admission of visitors should be prohibited, lest the emotions be stimulated to a point equivalent to that of vigorous exertion. Smoking during the night and morning previous to the test should be interdicted.

Orderly Routine. If the patient is transferred from his room to a metabolism department in the hospital, he should be allowed to rest at least 20 minutes before the mouthpiece is attached. This interval will permit of muscular relaxation and mental orientation.

The technician's maneuvers should be executed deftly, calmly and gently. There should be a minimum number of attendants essential to facilitate the procedure. There should be no confusion whatever. After the arrival of the patient, no one who is not directly needed in the actual performance of the test should be admitted to the metabolism department. The entrance of the operating surgeon during the progress of a test is known to have resulted in a false, high metabolic reading.

Evaluation of Readings. When the basal metabolic rate is computed, the degree of variation should be compared with the clinical impression. If there is too great disparity, the test should be repeated until a reasonable correlation is established. In any event, excessively high metabolism reports for clinically low or doubtfully toxic patients call for a repetition of the test. The greatest errors seem to be in the upward direction because patients do not adapt themselves readily to hospital routine. Rarely, therefore, is the first test of any value. If wide variations occur between successive tests, or between several tests made within a period of a few days, the readings should be assumed to be incorrect and further readings should be obtained.[2]

Partially as the result of advertisements of various manufacturers of metabolism equipment, the noxious practice of having patients present themselves at physicians' offices or at laboratories immediately preceding metabolism tests is continued; and yet, cursory observation is sufficiently conclusive to condemn such practices. A constant error of 10 to 25 per cent in an upward direction is the consequence of tests made under these circumstances. Neither a highly neurotic individual nor one who suffers from thyrotoxicosis can be in a basal state of metabolic activity after walking, riding or driving to an office. The greater the distance travelled the more numerous will be the encounters with nervous system stimulants, resulting in a corresponding divergence from the basal rate. As previously stated, metabolism is increased in variable ratios to the work done, whether that work be expressed in physical, digestive or nervous energy. That premise has been, and indeed, can be readily proved. In certain of the neuroses minor degrees of stimulation give rise to an emotional explosion. How is it possible, then, for highly neurotic people whose every contact serves to whip their sensitized nervous systems into excesses, to reach a basal rate of metabolism by resting a mere half hour after active exercise or after ordinarily moderate excitement? It is in the latter group of patients that the basal metabolism test is of especial assistance in differential diagnosis, provided the test is precisely executed under ideal circumstances.

It is also a recognized fact that thyrotoxic patients are emotionally most unstable. Not infrequently their nervous reactions closely resemble those characteristic of actual psychoses. In these, metabolic activity is extremely increased. However, carefully conducted tests show that the basal metabolic rate very rarely rises to plus 100. More often it ranges

between plus 55 and 75, falling to between plus 35 and 55 in less toxic cases and to between plus 20 and 35 in milder cases[3]. In nodular toxic goiter the rate is lower than in diffuse toxic goiter, usually ranging from plus 20 to 35.

CONCLUSIONS

1. The subordination of methodical reasoning and systematic clinical observation to technical measures is to be condemned.

2. Metabolic readings are of inestimable value in the study of thyroid disease; but the diagnosis of thyroid states based upon the metabolic rate alone is often erroneous.

3. A knowledge of those conditions in which the metabolic rate is affected is essential to the proper application and interpretation of the test.

4. The efficacy of metabolic criteria in the diagnosis of early hyperthyroidism has not been established by experience.

5. A number of thyrotoxic patients have been operated upon inopportunely, with resultant serious consequences, because the surgeon relied upon untrustworthy metabolism data. The clinical condition of the patient is the best criterion of safe operability.

6. Confidence in the results of metabolism tests is dependent upon the competence of the technician, integrity of the apparatus employed, preparation of the patient so that a trustworthy basal rate is assured, orderly routine of the test procedure and the proper evaluation of metabolic readings.

7. The noxious practice of having patients present themselves at distant offices immediately preceding metabolism tests is contrary to an assured basal state of metabolism. Metabolism is increased in variable ratios to the work done, whether that work be expressed in physical, digestive or nervous energy; and the greater the distance travelled the more numerous will be the encounters with nervous system stimulants, a circumstance resulting in a corresponding divergence from the proper basal rate.

8. The basal metabolic rate very rarely rises to plus 100. More often it ranges between plus 55 and 75, falling to between plus 35 and 55 in less toxic cases and to between plus 20 and 35 in milder cases. In nodular toxic goiter the rate is lower than that in diffuse toxic goiter, usually ranging from plus 20 to 35.

9. The basal metabolism test is of value as a control in the regulation of treatment in hypothyroidism.

SUMMARY

Indications for the use of the basal metabolism test and misapplications of the procedure are discussed. Reliance upon tests alone, without consideration of clinical findings, and incompetent interpretation of laboratory findings are condemned. Pathologic conditions in which the basal rate may be above or below normal, and which must therefore be differentiated from thyroid disease by clinical methods, are described. Efficiency of the technician, proper preparation of the patient and mechanical perfection are stressed.

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RÉSUMÉ

Le metabolisme de base: considérations pratiques

Il est discuté dans cette communication l'emploi et la technique de l'épreuve

du metabolisme de base. L'auteur signale aussi les applications fautives de technique. Il ne faut pas se baser uniquement sur le test. Il faut prendre en considération les symptômes cliniques que presente le malade. Il importe de bien préparer le malade d'avoir recours à un technicien avisé et de s'assurer de la perfection mécanique de l'appareil. Il est décrit dans l'article des états pathologiques dans lesquelles le metabolisme de base est augmenté ou diminué et qu'il faut par l'examen clinique différencier des maladies de la glande thyroide.

ZUSAMMENFASSUNG

Grundumsatz: Praktische Überlegung

Die Indikationen der Grundumsatzbestimmung und die falsche Anwendung dieser Methode werden beschrieben. Es wird nicht nur verurteilt sich allein auf Laboratoriumsmethoden zu verlassen, ohne die klinischen Symptome zu berücksichtigen, sondern auch die nicht massgebende Auslegung der Untersuchungsergebnisse. Krankhafte Zustände, bei denen der Grundumsatz entweder erhöht oder erniedrigt ist und die deshalb von Schilddrüsenerkrankungen durch klinische Methoden unterschieden werden müssen, werden genauer beschrieben. Besonderen Nachdruck wird auf die Verlässlichkeit der Laborantin, auf die richtige Vorbereitung des Patienten und auf die Technische Fehlerfreiheit gelegt.

SUMARIO

Metabolismo Basal: Consideraciones Practicas

Las indicaciones para el uso del metabolismo basal y sus aplicaciones herroneas de su procedimiento son discutidas. Descansan en la prueba solamente, sin consideraciones de los hallazgos clínicos, y interpretaciones incompetentes de reportes de laboratorio son condenados. Condiciones patológicas en las cuales el metabolismo basal puede estar alto ó bajo de lo normal y el cual debe de ser diferenciado de las enfermedades tiroideas por métodos clínicos son descritos. Eficiencia de los tecnicos, preparación propia del enfermo y perfección mecánica son de verdadera consideración.

RIASSUNTO

Il metabolismo basale: considerazioni pratiche

Le indicazioni per l'uso della prova del metabolismo basale, e i relativi errori vengono discussi. L'affidarsi solamente su questa prova, senza considerazione dei risultati clinici, e una interpretazione inconpetente delle ricerche di laboratorio, vengono biasimati. Vengono descritte le condizioni patologiche in cui il M.B. può essere al disopra o al disotto del normale, da differenziarsi da disturbi tiroidei. La competenza del tecnico, la preparazione adatta del malato, e la perfezione meccanica, hanno capitele importanza.

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Dr. George P. Müller, professor of surgery at Jefferson Medical College, has been appointed to the Grace Revere Osler chair of surgery at Jefferson Medical College. Dr. Müller was graduated from the University of Pennsylvania School of Medicine in 1899.

The status of director of the British Royal Air Force Medical Services has been advanced to that of director-general with the rank of air-marshal. Air Marshall **Sir Albert Richardson,** director of the medical services, thus has been made director-general.

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NATIONAL ASSEMBLY OF U. S. CHAPTER, I.C.S.

The United States Chapter of the International College of Surgeons will hold its fourth annual assembly in Venice, Florida, February 11-14, 1940. A complete program will appear in the February issue of the Journal.

SESQUI-CENTENNIAL CELEBRATION OF THE MEDICAL SOCIETY OF DELAWARE

The Medical Society of Delaware held its one hundred and fiftieth annual session October 9-11 at the Delaware Academy of Medicine in Wilmington under the presidency of Dr. Meredith I. Samuel.

One of the outstanding features of the meeting was the exhibit of books, photographs, instruments and other articles belonging to the early members of the Society, some of the articles being the property of the Academy and others being loaned by interested persons.

Dr. Fred. H. Albee, of New York City, president-elect of the International College of Surgeons, spoke on "The Massive Resection of Bone Sarcoma with Immediate Bone Graft Replacement." Other papers presented were "Sulfapyridine as a Bacterial Chemotherapeutic Agent;" "The Difficulty in Early Diagnosis of Primary Cancer of the Lung;" "Right Paraduodenal Hernia;" "Hormone Therapy: Uses and Abuses;" and "Ophthalmology and Its Relation to Industry."

Speakers at the banquet for members of the society and of the Woman's Auxiliary were the Hon. Richard C. McMullen, governor of Delaware; Mrs. Rollo K. Packard, national president of the woman's Auxiliary, American Medical Association; Dr. L. A. H. Bishop, past president of the Medical Society of Delaware; and Dr. Rock Sleyster, president of the American Medical Association.

In commemoration of the Society's 150 years of existence, Dr. Samuel, president, compiled an excellent book. The Society was organized by a group of 27 physicians just 12 days after Washington took the oath of office. Numerous pictures and short biographic sketches of many of the early presidents embellish the text.

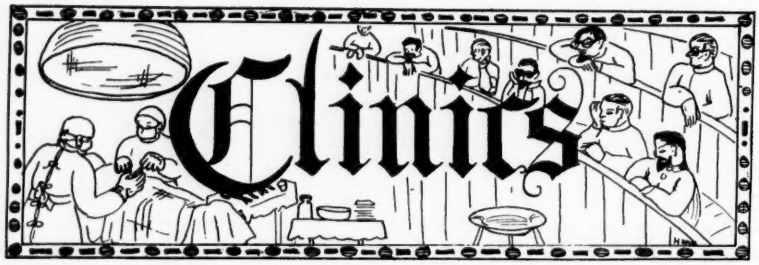
GRADUATE FORTNIGHT OF NEW YORK ACADEMY

"The Endocrine Glands and Their Disorders" was the subject discussed at the twelfth annual Graduate Fortnight of the New York Academy of Medicine which opened October 23. In addition to the 2,300 fellows of the academy, 700 visiting physicians were registered.

Dr. Malcolm Goodridge, president of the academy, opened the conference with an address of welcome. Twenty-two clinical demonstrations were held in seventeen of the hospitals of New York City and eight round table conferences were conducted. Speakers drawn from the leading universities and research institutions of the United States and Canada addressed the ten evening meetings.

They included: **Dr. H. M. Evans,** director of the Institute of Experimental Biology of the University of California; **Dr. J. B. Collip,** professor of biochemistry, McGill University; **Dr. Elmer L. Sevringhaus,** professor of medicine, the University of Wisconsin; **Dr. Walter B. Cannon,** professor of physiology, Harvard University; **Dr. Robert F. Loeb,** professor of medicine, Columbia University; **Dr. C. N. H. Long,** Sterling professor of physiological chemistry, Yale University; **Dr. R. T. Woodyatt,** clinical professor of medicine, Rush Medical College; **Dr. John F. Fulton,** Sterling professor of physiology, Yale University; **Dr. William G. MacCallum,** professor of pathology, the Johns Hopkins University, and **Dr. Philip E. Smith,** professor of anatomy, Columbia University. The scientific exhibit, which covered many aspects of endocrinology, was in the building of the New York Academy of Medicine.

Exhibits of recent advances in the various fields of pure and applied science are desired by the **American Association for the Advancement of Science** for its annual exhibition, which this year will be held at Columbus. Space will be provided for exhibits of special interest to members of the association attending the meeting. Applications should be made to the Director of Exhibits, 3941 Grand Central Terminal, New York, N. Y.



COLORADO STUDY GUILD

Colorado members of the International College of Surgeons organized a Postgraduate Study Guild at a special meeting held November 8.

Dr. W. T. H. Baker, F.A.C.S., F.I.C.S., of Pueblo, was elected president; Dr. L. E. Likes, F.A.C.S., F.I.C.S., of Lamar, vice-president; Dr. G. H. Stine, F.I.C.S., of Colorado Springs, secretary; and Dr. E. B. Liddle, F.I.C.S., of Colorado Springs, treasurer.

Others present at the meeting were Dr. G. B. Kent, F.A.C.S., F.I.C.S., of Denver; Dr. H. A. Black, F.A.C.S., F.I.C.S., of Pueblo; and Drs. G. W. Bancroft, F.A.C.S., F.I.C.S., F. O. Kettelkamp, F.I.C.S., and M. O. Shivers, F.I.C.S., of Colorado Springs.

INDIANA STUDY GUILD

Plans for a clinical meeting to be held in December at the clinic of **Dr. J. Rudolph Yung,** in Terre Haute, were made at the second meeting of the Indiana Study Guild, International College of Surgeons, held October 25 at the Indianapolis Athletic club. Dr. Yung presided.

This clinical meeting will initiate a series of similar clinical sessions which will constitute a part of the educational program of the Guild. In addition, round table discussions on the fundamental medical sciences will be conducted.

Dr. Yung, president, appointed a membership committee consisting of **Dr. Goethe Link, Dr. William F. Hughes** and **Dr. John W. Emhardt,** all of Indianapolis.

Other officers are Dr. Hughes, vice-president; **Dr. Simon Reisler,** secretary; **Dr. Carl B. Sputh,** treasurer; and **Dr. Vincent A. Lapenta,** Senior State Regent, and **Dr. Karl Ruddell,** State Regent, counsellors. All are of Indianapolis.

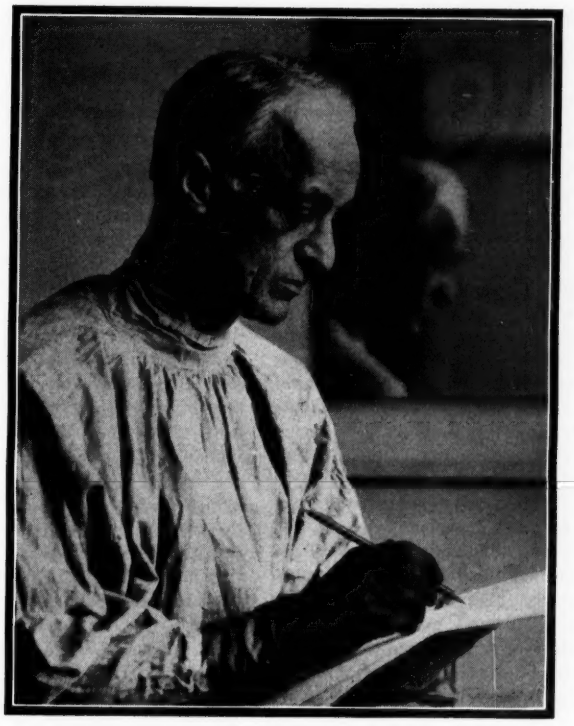
WEST VIRGINIA GUILD MEETING

Parkersburg was selected as the next meeting place of the West Virginia Guild, International College of Surgeons, at the meeting held November 2 at the Charleston General Hospital. **Dr. Thomas Harris,** of Parkersburg, was chosen to act as chairman, succeeding **Dr. G. G. Irwin,** of Charleston, and **Dr. King Buford,** of Charleston, was elected secretary, succeeding Dr. Harris.

A day's activities marked the Charleston meeting, with 20 in attendance. An operative clinic was conducted in the morning by **Dr. John E. Cannaday,** Senior Surgical Regent of the State, and **Dr. H. A. Bailey,** both of Charleston. This was followed by a pathological demonstration on embolism and thrombosis by **Dr. Walter Putchart.**

Luncheon was served by the hospital at noon. The afternoon was spent in discussing the morning's work, **Dr. Benjamin I. Golden,** of Elkins, treasurer of the United States Chapter, stimulating the discussion by acting as questioner. Dr. Golden also explained the purposes of the College and of the Guild meetings and pointed out the benefits derived from observing demonstrations of surgery performed under every day conditions as compared with those obtained merely from watching a surgeon demonstrate his scientific ability. The meeting adjourned at 4:30.

Obituaries



Harvey Cushing, most distinguished of all surgeons in operative procedures on the brain, recognized as an accomplished author, educator, philospher and leader, died in New Haven, Conn., Saturday, October 7, of coronary thrombosis. He was the fourth Cushing in a direct line to win distinction in a medical career.

Dr. Harvey Cushing was born in Cleveland, April 8, 1869, the ninth child in his family. His well known brother, Edward F. Cushing, M.D., a pediatrician, died in 1911; his father, Henry K. Cushing, formerly professor of obstetrics and gynecology in Western Reserve University School of Medicine, died in 1910; his grandfather, Erastus Cushing, died in 1893, and his great grandfather, David Cushing Jr., of Massachusetts, died in 1840.

After receiving the bachelor of arts degree at Yale in 1891, where incidentally he also played baseball, Dr. Harvey Cushing graduated from Harvard Medical School in 1895, receiving the degrees of master of arts and doctor of medicine. He entered the Massachusetts General Hospital as surgical intern, working with Dr. J. C. Warren. In 1896 he went to Baltimore as junior assistant in the surgical service of Halsted, becoming resident surgeon in 1897 and developing as instructor in surgery, assistant in surgery and asso-

ciate in surgery. He made the first roentgenograms that were made at Johns Hopkins Hospital and did experimental studies on gallstones, the bacteriology of the alimentary canal, and cocaine anesthesia. In 1900 he studied abroad, traveling with Drs. William Osler and Thomas McCrae. On this trip Dr. Cushing studied in England and France for a year in Kronecker's laboratory in Berne. Here he carried out some investigations suggested by Kocher on the physiologic relationships of intracranial tension. This work he continued in the laboratory of Mosso in Turin, Italy, and then for four months he worked with Sherrington in Liverpool studying the motor cortex in anthropoids. Late in 1901 he returned to Baltimore and asked for the post of neurosurgeon in the clinic. Here he remained until 1912, during which time he became associate professor of surgery. He gave the Mutter lecture in Philadelphia in 1901. He became a member of the American Neurological Association in 1903 and president in 1923, a charter member of the American Society of Clinical Surgery in 1903 and president in 1921, a member of the American Physiological Society in 1905, a fellow of the American Surgical Association in 1906 and president in 1927. Dr. Cushing was secretary of the Section on Surgery and Anatomy of the American Medical Association in 1906-1907. He gave the Carpenter lecture in New York in 1906 and the W. M. Banks Memorial lecture in Liverpool in 1909 and the Harvey lecture in New York in 1910. During this period he developed his marvelous technic in neurosurgery. The earlier operations were failures, but Dr. Cushing's courage, precise technic and remarkable spirit began to yield success and his fame spread widely. During this period he developed and described the subtemporal decompressive operation and perfected hemostasis in operations on the brain and new technics for suture. His contributions to the physiology of the brain, the spinal fluid and the pituitary body were fundamental.

In 1912 Dr. Cushing became Mosely Professor of Surgery at Harvard and Surgeon-in-Chief to the Peter Bent Brigham Hospital. He received the master of arts from Yale in 1913, gave the oration of surgery at the International Congress of Medicine in London in 1913 and was made a fellow of the Royal College of Surgeons, of the American College of Surgeons of which he became the president in 1922 and of the Institute of Hygiene in London. He gave the Weir Mitchell lecture in Philadelphia in 1914 and was elected at that time a foreign member of the Société de neurologie in Paris, of the American Academy of Arts and Sciences and of the Washington Society of Arts and Sciences.

In 1914 came the great war, during which the remarkable service rendered by Harvey Cushing was universally recognized. He served with distinction in the British Expeditionary Force; he became surgical director of the United States Base Hospital No. 5 and was appointed senior consultant of neurologic surgery with the American Expeditionary Forces with the rank of colonel. For these services he received the Distinguished Service Medal of the United States, the Companion of the Bath of England, and Officer of the Legion of Honor of France. His war service is reflected in his recently published "Diary of a War Surgeon." Evidently this service in the war was a terrific physical stress, for Dr. Cushing returned to Boston in 1919 suffering from peripheral neuritis, which was to handicap him during the remainder of his career. Nevertheless in the years from 1919 on he worked indefatigably. He turned to an interest in the history of medicine and made a complete collection of the writings of Vesalius. At the same time he developed a surgical team for neurologic surgery and himself studied intimately the microscopic anatomy, gross anatomy, pathology and physiology of conditions within the brain. Young surgeons flocked to him from all over the world. Today his pupils have won distinction as neurosurgeons. In 1918 he became fellow of the Royal College of Surgeons of Ireland. He received the degree of doctor of science from Washington University in 1919 and in the same year the honorary doctor of laws from Western Reserve University, doctor of science from Yale and Doctor of Science of Queen's University, Belfast. In 1920 he received the degree of honorary doctor of laws from Cambridge and in 1921 was made honorary fellow of the Medical Society of London, giving the chief oration in 1927. In 1921 he became a corresponding member of the Medical Society of Vienna and in 1922 a Charles Mickle Fellow of the University of Toronto, also the Cavendish Lecturer (London) and was awarded the title of Honorary Perpetual Student of St. Bartholomew's Hospital, London. He also became a corresponding member of the Medico-Chirurgical Society of Edinburgh.

After the death of Sir William Osler, Lady Osler turned over all her data relative to her distinguished husband to Harvey Cushing and he took up the task of preparing the famous biography. This book appeared in 1925 in two large volumes and was awarded the Pulitzer Prize as the best biographic writing of the year.

In the meantime he continued his surgical operations and received additional honors. In 1923 he became a foreign member of the Académie de médicine of Paris and a fellow of the Association of Surgeons of Great Britain and Ireland. In 1924 he gave the Cameron Prize Lecture at Edinburgh and was elected a corresponding member of the Società medico-chirurgica di

William Bradley Reid, M.D., F.I.C.S., of Rome, N. Y., died November 10, at the age of 66 years. He will be remembered not only for his work as a surgeon but also for his service to his city, of which he was mayor in the early twenties and again in the early thirties, and for his military service overseas. He traveled widely, to observe people and to study medical science and other forms of government. He studied especially the causes of goitre among the people of South America, whom he visited twice for this purpose. The president of Venezuela once placed an airplane at his disposal, appointed Father Para, a Catholic Priest who was also a surgeon, as Dr. Reid's assistant, and offered every aid and personal cooperation to this stranger from the United States. He entered the war of 1914 voluntarily, was wounded, and was honored with military titles. Among honorary pall bearers were Chancellor William Pratt Graham of Syracuse University; Dean Herman G. Weiskotten of the College of Medicine, Syracuse University; Supreme Court Justice Hawley N. Crosby, Falconer, N. Y.; Capt. Rollin L. Bauchspies, Medical Corps, U. S. Army, professor of military medical science and ranking medical officer of the First Military Area, Syracuse University; and Prof. Ernest Reed, director, Syracuse University Andean Expedition.

Bologna. In 1926 he received the honorary doctor of laws from the University of Glasgow, in 1928 the doctor of laws from Jefferson Medical College and the Doctor of Medicine from John Casimer University of Lwow, Poland. In the following year he was made honorary fellow of the Royal Society of Medicine of England, of the Royal Academy of Medicine of Ireland, master of surgery of Trinity College, London, doctor of laws of the University of Edinburgh and a fellow of the Royal College of Surgeons of Edinburgh. In 1929 there was published in his honor a special number of the *Archives of Surgery,* dedicated to his sixtieth birthday. A similar festschrift was later published by *Acta medica Scandinavica.* In 1932 Dr. Cushing retired from his posts in Boston and became Sterling professor in the School of Medicine of Yale University, teaching neurology and the history of medicine and holding this position until 1937, when he became emeritus professor.

In addition to the famous "Life of Sir William Osler," Dr. Cushing published "The Pituitary Body and its Disorders" in 1912, "Tumors of the Nervous Acusticus" in 1917, with Dr. Percival Bailey "A Classification of the Gliomata" in 1925, collected essays under the title "Consecratio Medici" in 1928, "Intracranial Tumors" in 1932, and in the same year a book on "The Pituitary Body and the Hypothalamus."

In July 1938 Oxford University conferred on him the honorary degree of doctor of science, on which occasion great physicians and surgeons from all over the world assembled to honor him. It was pointed out that his former pupils hold positions in Brussels, Louvain, Amsterdam, Manchester, Edinburgh, Leeds, London, Oxford and Newcastle-on-Tyne as well as in most of the leading clinics in the United States. There are honorary Cushing Clubs in many medical schools dedicated to his work and his memory.

Since 1931 great universities have continued to honor him. He gave other lectures, such as the Donald Balfour Lecture of the University of Toronto. In 1933 he was honored in Paris, at which time he was presented with the original copy of Clemenceau's thesis for the doctorate in medicine, written in 1865. He received also the honorary degree of doctor of laws from Northwestern University and the honorary degree of doctor of medicine from Budapest.

Of recent years Dr. Cushing had shown special interest in maintaining the traditional professional status of the physician and surgeon and he had given freely of his time and of his efforts in this endeavor. An essay called "Medicine at the Crossroads," published in THE JOURNAL, May 20, 1933, page 1567, defined his point of view. In this essay he wrote: "Those who deal with the science of society deal with something that actually does pulsate with so short a time cycle that conditions almost from year to year are never quite the same, so that our theories of today are likely to need modifying tomorrow. What this puzzled world needs perhaps is more study of the past, fewer commissions and surveys of the present, and a greater number of philosophically minded, self-supporting and law-abiding persons who can see all round their particular problem and independently devote themselves to it as do most doctors."

In the presence of such a record and such a career, in the light of such a character and such a man, superlatives fail. Great epochs in medicine are marked by the names of physicians whose careers have made these epochs. With Dr. Harvey Cushing, surgery of the brain became for the first time scientifically established. Of him it may be truly said that he was in all that he attempted greatest of the great.

J.A.M.A.

Book Reviews

Les Erreurs et les Fautes en Urologie. By L. Strominger, Docent d'Urologie à la Faculté de Médicine de Bucarest; Lauréat de l'Académie de Médicine de Paris. Introduction by Prof. G. Marion. Pp. 176. Paris: Masson et Cie., 1939.

IN this exceedingly interesting monograph, the author considers the errors which are not infrequently made in the diagnosis, prognosis and treatment of urogenital conditions. Professor Marion has written a laudatory introduction which has as its main theme the well-established fact that "we learn more through our errors than through our successes."

The experienced urologist cannot fail to be impressed by the frequency with which he encounters the recital of diagnostic or therapeutic errors which his own errors and experience have taught him to avoid. The book is packed full of urologic wisdom and caution which only a man with a large practical experience could have acquired. To take but two simple instances: The author has a high respect for the damage that the cystoscope can do under certain conditions and he warns against its indiscriminate routine use — a warning which should be sounded in the ears of all ambitious surgical and urologic interns. He also tells of the innumerable appendicectomies that have been done erroneously for ureteral and vesicular conditions which had no relevance whatever to the appendix.

This is not new, of course, but it does bear constant repetition and more repetition until these simple yet important pitfalls will have become part of the urologist's or surgeon's consciousness. That is why this book is valuable. It emphasizes the things which we have already learned and are likely to forget, and in addition it teaches valuable lessons that we may never have known.

Step by step, in orderly fashion, the entire urogenital tract is thoroughly yet briefly covered as to non-surgical and surgical affections, beginning with the kidney and continuing through the ureters and the bladder down to the genital organs.

The opening chapters on truth and error in science, especially in psychology and biology, make an instructive dissertation on the significance and practical application of truth and error in the field of surgery and urology, which constitutes the body of the work. The book ends with a consideration of errors in radiology, which every surgeon and urologist should read because of its importance.

It may be said, in conclusion, that a careful study of this valuable volume will help the reader to avoid many snares and pitfalls, with their occasionally unhappy consequences. The bibliography, while rather extensive, is limited to the works, mostly French, consulted by the author.

WOLBARST.

Practical Obstetrics. By P. Brooke Bland, M.D., F.A.C.S., F.I.C.S., Professor Emeritus of Obstetrics, Jefferson Medical College of Philadelphia, and Thaddeus L. Montgomery, M.D., F.A.C.S., Clinical Professor of Obstetrics, Jefferson Medical College of Philadelphia. Third edition. Price, $8. Pp. 877 with 502 engravings and 27 colored plates. Philadelphia: F. A. Davis Co., 1939.

IN the third edition of "Practical Obstetrics" the authors still adhere to the feature which characterized previous editions, "brevity and directness of text." This style lends itself admirably to the needs of the medical student and general practitioner.

The touch pictures which accompany descriptions of the normal and abnormal mechanisms of labor are self explanatory and should be of great value to those who are attempting to master the various mechanisms. The authors still advise packing the uterus following curettage for incomplete abortion, regardless of whether or not the contents have been infected. Statistics show an increased morbidity and mortality following packing technic.

Obstetrical analgesia and anesthesia are discussed with the following conclusions:

1. Morphine is to be used in prolonged labor.
2. Barbituric acid derivatives are to be used for amnesia in short labor, under careful supervision.

3. Nitrous oxide and oxygen is very efficient for second stage pains and low forceps and spontaneous deliveries.
4. Ether is perhaps the most useful anesthetic in obstetric practice.
5. Local anesthesia solves the problem in heart disease, toxemia and depression from hemorrhage.

A rapid review of the role played by the endocrine glands in menstruation, ovulation and placentation is well handled.

The book concludes with an extensive chapter on obstetrical jurisprudence and an extensive bibliography. As a whole it may be stated that the text is a distinct and valuable contribution to contemporary obstetrical literature. The work is practical, comprehensive and truly worth while. It should be in the library of everyone interested in the practice of obstetrics.

L. J. GOODMAN.

Annual Review of Physiology. Edited by James Murray Luck. Price, $5. Pp. 712. American Physiological Society and Annual Reviews, Inc., Stanford University, P. O., California, 1939.

THE American Physiological Society has undertaken the stupendous task of making a yearly *critical* review of the research work in physiology published through the world. The first volume is published with a joint Board of Managers composed of C. D. Leake, J. M. Luck, W. J. Meek and C. L. A. Schmidt, and an editorial committee composed of A. J. Carlson, J. F. Fulton, M. H. Jacobs, F. C. Mann and W. J. Meek.

The research work of over 3,100 authors is reviewed under the following chapters: *Permeability,* M. H. Jacobs; *The Biological Effects of Radiation,* Jane Howell Clark; *Physiological Aspects of Genetics,* G. W. Beadle; *Developmental Physiology,* Joseph Needham; *Growth,* C. B. Davenport and Otto Rahn, Mary E. Mayer, H. W. Chalkley and D. M. Pace; *Temperature Regulation,* Alan C. Burton; *Energy Metabolism,* John B. Murlin; *The Peripheral Circulation,* H. C. Basett; *Respiration and its Adjustments,* Robert Gesell; *Muscle,* Emil Bazler; *The Digestive System,* A. C. Ivy and John S. Gary; *Physiology of the Liver,* Frank C. Mann and J. L. Bollmann; *Blood: Physiology of Formed Elements and Plasma*; *Blood Clotting,* J. Harold Austin; *Heart,* J. A. E. Eyster; *Electrical Phenomena of the Brain and Spinal Cord,* Hallowell Davis; *The Spinal Cord and Reflex Action,* J. C. Eccles; *Biolectric Studies of the Excitation and Response of Nerve,* Detley Bronk and Frank Brink, Jr.; *The Autonomic Nervous System,* Joseph C. Hinsey; *The Special Senses,* J. M. D. Olmsted; *Physiological Psychology,* E. R. Hilgard and C. P. Stone; *Kidney,* Homer W. Smith; *General and Local Anesthesia,* M. H. Seevers; *Applied Physiology,* D. B. Dill; and *Endocrine Glands: Gonads, Pituitary and Adrenals,* Herbert M. Evans.

The book is well indexed by author and subject. Each chapter has a complete bibliography. It is an indispensable reference book for the surgeon preparing to qualify by examination for the American College of Surgeons, American Board of Surgery and the International College of Surgeons.

The American Physiological Society and the editor are to be congratulated for rendering such a valuable service to the Science of Surgery.

W. J. CARSON.

Operative Orthopedics. By Willis C. Campbell, M.D., Memphis, Tennessee. Price, $12.50. Pp. 1154, 845 illustrations, 4 color plates. St. Louis: The C. V. Mosby Company, 1939.

THE text is divided into 23 chapters. In the first chapter, the author considers the physiology and pathology of bones, joints, etc., thus laying the groundwork for the procedures which are described in Chapters 3 to 23, inclusive.

In Chapter 2, the construction, use, and adaptability of certain types of apparatus are described. This material is well illustrated and is interestingly presented. Chapter 3 should be read carefully by anyone who attempts surgical orthopedic procedures; and every orthopedic surgeon should insist that his surgical team read these pages. Chapter 4 explains the various surgical approaches and is filled with many excellent illustrations which assist the student in comprehending the text.

Chapters 5 to 23, inclusive, are well illustrated and cover the full range of orthopedic problems from the surgical standpoint. The chapter on fractures, by necessity, describes principally methods of treatment for fracture cases which have resulted in deformities or complications of some type or other. It is not intended, apparently, to cover the conservative treatment of fractures. This, in general, might be the comment concerning all the work described in this entire book. This point is, of course, brought out by the author in his preface.

The book has been carefully written and is excellently illustrated, but despite this there is one point about the text which is extremely confusing and that is the attitude taken by the author

in describing the number of degrees in which any extremity or part of an extremity may be moved from its neutral position. The terms employed are quite different from those customarily used in other textbooks and by the profession in general, so that the reader must continually stop to work out just what the author is talking about. To say that a man's arm is hanging at 180° in abduction when his arm is in the natural position, is indeed very misleading. The author also uses descriptive terms which are not those customarily used by other orthopedic surgeons. If this confusion were eliminated, it would greatly assist the average student and surgeon in reading the text and comprehending the meaning thereof.

H. B. TURNER.

Textbook of General Surgery. By Warren H. Cole, M. D., F.A.S.C., Professor of Surgery, University of Illinois College of Medicine, Chicago, and Robert Elman, M.D., Associate Professor of Surgery, Washington University School of Medicine, St. Louis. Second Edition. Price, $8. Pp. 1,031, with 559 illustrations. New York and London: D. Appleton-Century Co., Inc., 1939.

THIS work is primarily designed for the medical student. As pointed out in the preface, its substratum rests on lectures in general surgery and the specialties. It is a concise and clear work which stresses the fundamentals of general surgical practices.

The foreword by Evarts Graham stresses the fact, and justly so, that "it is futile to attempt to make an undergraduate an accomplished surgeon."

The opus begins with chapters on inflammation and repair and then proceeds to discuss the subjects of sepsis, antisepsis, infections, wounds and their treatment. The various special chapters are concise. Padding is eliminated; only the essence of the subject matter is presented. It is a difficult task to crowd the tremendous amount of germane material into one volume. The selection of essentials however, has been admirably accomplished.

Diagnosis, pathology and symptomatology are given much prominence. Surgical technic is accorded a subservient rôle. This is as it should be in a one-volume work with objectives as outlined in the preface.

All in all, the volume is an excellent work for the student and general practitioner alike. The authors should be congratulated on a difficult task well accomplished.

T.

Les Calculs de L'Uretere. By Pierre Macquet. Preface by Prof. Gaston Potel. Pp. 187, with 44 full-page plates and 22 illustrations. Paris, Masson et Cie., 1939.

THIS monograph deals with the ureteral calculus from the purely clinical standpoint. It is based primarily on the personal experience of the author, for many years assistant and chief of clinic under Professor Gaston Potel, who has written a laudatory preface.

Emphasis is placed throughout the work on the potential damage which the ureteral calculus can inflict upon its associated kidney and the imperative need for its early removal from the urinary tract in order to prevent or minimize this damage. Jeanbrau, who is credited with having done the first important work on the ureteral calculus, in 1909, is quoted approvingly as saying: "The renal calculus often can wait; the ureteral calculus cannot wait." This dictum is emphasized throughout the work.

As this is a clinical study, it naturally follows that diagnosis and therapy occupy the major portion of the book. There is little or no reference to the etiology of calculus or to the part which infection may play in its development. No mention is made, so far as this reviewer could find, of the outstanding work of Randall and other American urologists in this field.

The illustrations are well done and clearly indicate what they are intended to show. Various phases of calculous invasion of the ureter are depicted in twenty-seven cases, which are reported in detail. An extensive bibliography covering the last 30 years closes the work.

With all due deference to the aims of the author, it may be said that this volume offers little that is either new or interesting to the American urologist.

WOLBARST.

Cancer of the Colon and Rectum. By Fred W. Rankin, B.A., M.A., M.D., Sc.D., F.A.C.S., Surgeon, St. Joseph's and Good Samaritan Hospitals, Lexington, Kentucky; and A. Stephens Graham, M.D., M.S. (in Surgery), F.A.C.S., Surgeon Stuart Circle Hospital, Richmond, Virginia, and Assistant Professor of Surgery, Medical College of Virginia. Price, $5.50. Pp. 358, with 133 illustrations. Springfield, Illinois and Baltimore: Charles C. Thomas, Publisher, 1939.

THIS excellent work springs from the pen of a master in bowel surgery and his associate. It may be stated at the outset that every surgeon interested in this absorbing and timely subject, as all surgeons should be, should

possess this volume if he wishes to be abreast with the advancements in the treatment of surgical affections of the colon and rectum.

Even a casual survey of the volume engages the attention of the reader. On page 24, for example, the anatomy of the colon, together with the technic for its immobilization, is vividly sketched with pen and ink, leaving an indelible impression. Figure 15, page 27 belongs to the same category and depicts the correct and incorrect method of clamping epiploic appendages, thus illustrating the old Chinese dictum that one picture is worth a thousand words. The majority of illustrations are excellent.

This reviewer was particularly impressed with the chapter dealing with physiology on pages 38-43, and especially its reference to colitis. Here again, in the brief space of two or three pages, much worthwhile material is presented. This is of interest not only to the surgeon but to the general practitioner as well. The authors stress the grading of carcinoma by Broders and depict comprehensively the question at issue. The late Dr. Richard Jaffé was not quite in accord with the conclusions here stressed. Equally, the authors follow the Miles scheme of distribution of the lymph apparatus which is accepted in some quarters with reserve.

The chapter on symptoms and diagnosis is painstakingly thorough, extremely practical and engagingly encyclopedic in nature. The chapter on differential diagnosis should be studied by every medical man, be he surgeon or physician. Chapter 6 contains a wealth of statistical material, from which many valuable lessons are learned. In thoroughness and up-to-dateness this reviewer knows of no better work.

From the practical point of view the surgeon is guided in Chapter 7 to the proper choice of operation best suited for a given case. Thoroughness here is the apex of an obviously painstaking literary effort. Sir Hugh Devine's work on operative procedures in malignancies of the bowel is not mentioned. The chapter concludes with a rich résumé of statistical data and methods of procedure used in various clinics. Pre- and postoperative care are succinnctly described.

After a brilliant exposé of the subjects under discussion, the authors present an excellent pen picture of the history of bowel surgery. This is followed with an evaluation and discussion of the technical methods resorted to when the condition is complicated by intestinal obstruction. They conclude with a thorough description on procedures for extirpation of lesions of the colon, rectosigmoid, rectum and anus (Chapters 13, 14).

A final touch of thoroughness is added by the concluding chapter on palliative and miscellaneous procedures dealing with exclusion methods (partial and complete), as well as operations on the sympathetic nervous system as related to bowel surgery.

Each chapter is followed by a comprehensive and thorough bibliography. There is an author's index as well as an index of subjects.

This classical work should be in the hands of every medical man whose primary interest is the welfare of his patient, and who is eager to improve his knowledge on matters related to morbid conditions of the bowel. Credit is due to the publishers for excellent printing and good binding.

MAX THOREK.

Prima e dopo l'operazione chirurgica. By Prof. Luigi Bobbio, Docent in Royal University, Turin; Chief Surgeon in St. Giovanni Hospital, Turin. Pp. 431, with 64 illustrations. Torino: Unione Tipografice-Editrice Torinese, 1937.

THIS treatise by Prof. Bobbio carries a subtitle, "Physiology and Clinical Aspects of the Operandus and of the Operatus," which gives the true tone to the book and indicates its great value. Bobbio stresses the point that the surgeon should know the physiology of the individual who is submitted to a surgical operation. This physiology is quite different from the normal physiology, and unless the Surgeon is thoroughly familiar with it, he will fail to do justice to his patients. This physiological knowledge is the essential, fundamental base on which the clinical aspects of the operandus and operatus should be observed, studied and interpreted. The reviewer is happy to record the emphasis with which Bobbio insists on these points, because he believes that they are so essential to good surgery that their importance is never emphasized enough.

Following the logic of this premise, Bobbio studies the operandus and operatus as an individuality; that is, he insists on studying the physiological and clinical problems concerning each individual. The general aspects of the conditions which may affect the operandus and the operatus are not neglected. On the contrary, they are dealt with in a very clear, comprehensive and up-to-date manner. Having, for instance, dealt with disturbances of respiratory, circulatory and other systems and complications, such as diabetes, hyperthyroidism, etc., he returns to the importance of considering how these conditions may affect each operatus and operandus. With sound logic Bobbio sets forth the problems to be solved before the operandus is submitted to the operation in order to avoid avoidable complications and to take care of the unavoidable complications which may follow the operative intervention.

Without entering into a detailed report of each

chapter, the reviewer would like to emphasize the importance of the chapter on spiroscopy and spirotherapy. The importance of spiroscopy and spirotherapy is very great. American surgeons would greatly profit by the clear exposition of the subject in Bobbio's work.

The treatise is well balanced and clearly written and is based mostly on what Bobbio in his long and successful practice has observed and done. The reader will not find useless reference to controversial matter, to cultural citations. The little book is whole meat, a true delicate tenderloin steak without useless fat and bone.

If every Surgeon would apply intelligently the knowledge of the problems of the operandus and of the operatus which is squeezed into the 430 small pages of Bobbio's book, every patient would be properly prepared for any surgical operation; postoperative complications would be fewer and less serious and would be taken care of in such a scientific manner as to reduce greatly mortality and morbidity.

A. L. SORESI.

The Story of Surgery. By Isaac Harvey Flack. Price, $3.75. Pp. 425. New York: Doubleday, Doran & Company, Inc., 1939.

SURGERY, the oldest known science, has received the interest and support of the lay public for thousands of years. Since the advent of the printing press, progress in the science of surgery has been recorded in all languages with the majority of the original articles appearing in journals covering medical and surgical subjects.

In 1895 John S. Billings published a history of surgery, covering 3000 years, which has remained the most important essay in the English language. Since 1920 the International Society of the History of Medicine has aroused a new interest throughout the Profession. James H. Breasted in 1929 completed his translation of the Edwin Smith Surgical Papyrus, which has become recognized by historians as an authentic record of the practice of surgery by Imhotep in the thirteenth century B. C.

More recently E. A. Hooton in "Apology for Man" (*Forum*, June, 1936) points out: "Human culture is far more ancient than the language, possibly because no material evidence of the existence of the latter is available before the invention of writing. Nevertheless, beginning with the dawn of the Pleistocene, perhaps over one million years ago, we possess an almost unbroken sequence of man made stone tools. For at least 30,000 years and thrice that period of time man has existed at his modern anatomical status."

Isaac Harvey Flack, author of "The Story of Surgery," presents some new facts in the early history of surgery and makes available to the profession and the lay public a vast amount of authentic material, written in a pleasing style and printed on good paper with a clear type. The first paragraph caused the reviewer to read until five A. M. *"Man left his anthropoid cousins some two million years ago.* The cleavage was not abrupt. It is difficult to estimate just how long it was before the divorce was complete, but the most ancient remains of man date back only to about 350,000 years B. C. and it would seem that man has existed, as now, for not much more than half a million years. Half a million years ago man began an endless struggle against disease. Since the last glacier retreated man has had to fight for health, and the first weapon in the hands of the first surgeon was a flint."

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Here is a book that deserves the praise that reviewers are heaping on it. *Surgery* says, "The volume can be wholeheartedly recommended to any serious student of surgery," and the *Journal of the A. M. A.* goes further and states, "It should be very valuable to the general practitioner as well as the specialist." Superb illustrations, most of them in color, aid in clarifying points which the text brings out. It is clearly and concisely written and the editors have interspersed their own illuminating comments with the text so that American readers may find every procedure clearly stated. It contains, in the main, surgery of the head and neck, exclusive of the brain and certain aspects of surgery of the face. It is of value not only to the surgical specialist, but to the general surgeon and surgical student as well.

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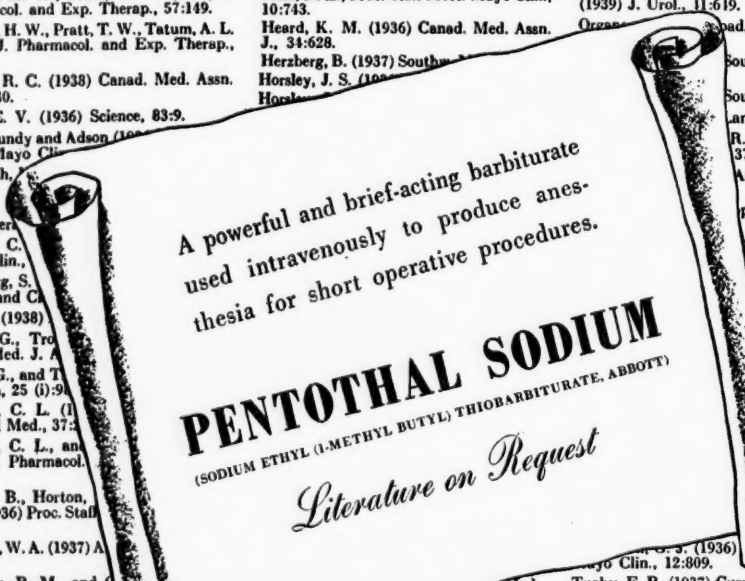
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